

REMARKS

Reconsideration and allowance of the above referenced application is respectfully requested.

Claims 2, 4, 5, 8-14, 17-20, and 24-46 are currently pending in the above referenced application.

Claims 2, 4, 5, 8-14, 17-20 and 24-46 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hendrickson et al. (Nucleic Acids Research, 1995, 23(3): 522-529) in view of Gibson et al. (Genome Methods 1996, 6: 995-1001) and Gold et al. (U.S. Patent 5,475,096).

Applicants respectfully traverse the rejection.

To establish a *prima facie* case of obviousness, three basic criteria must be met. There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. There must be a reasonable expectation of success of such modification or combination of references. Finally, the prior art references cited must teach or suggest all the claim limitations. Importantly, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not in the Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In making the combination of references in the present rejection, the Examiner has repeatedly stated that elements, which are admittedly missing from the primary reference cited were "well known in the art" at the time of the invention and for that stated reason alone, additional references have been combined with the primary reference in an effort to reconstruct the claimed invention using Applicant's disclosure as a template. For example, the Examiner admits that "Hendrickson et al. do not teach that the detector molecule is an aptamer and they do not teach that the amplified aptamer is quantitated or detected using a detectable non-primer

probe and real time PCR." (See Office Action, page 3, top partial paragraph). Immediately following this admission, the Examiner states that Gibson et al. teaches real time PCR using detectable non-primer probes and without any citation from within the references asserts that the combination would be obvious simply because the use of real-time PCR was well known. The Federal Circuit has clearly indicated that it is not enough that a combination of references includes every element of the claimed invention but there must be a motivation to combine other than the level of skill in the art at the time of the invention. See In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) where the Court stated that such a combination without motivation was improper. Further, Al-Site Corp. v. VSI Int'l Inc., 174 F3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) reaffirmed that the level of skill in the art cannot be relied upon to provide the suggestion to combine references.

The Examiner's further references to Gold et al. and the combination of the teaching to use aptamers in combination with the disclosure of Hendrickson et al. in the last paragraph of page 3 of the reference is equally without a teaching to combine or a suggestion of success of such combination. In making this combination, the Examiner asserts that "aptamer detector molecules were well known in the art at the time" and without any basis cited from within the references themselves, as required by In re Vaeck, (Fed. Cir 1991), the Examiner proceeds to combine the references.

While the Applicants invention teaches a washing step to remove nuclease, the Examiner's Official Action refers to Hendrickson et al. teaching of washing the capture molecule target to remove unbound sample. Without further remarks, the Official Action would suggest that simply by having a washing step, Hendrickson et al. was in concert with the Applicants' invention. In fact Hendrickson et al. did not contemplate the use of aptamers, as in the Applicant's method, and therefore would not necessarily be aware of or concerned with the effect

of nucleases on aptamers. That being the case, Hendrickson et al. can hardly be credited with teaching washing the antibody:target molecule:aptamer ternary complex to remove nucleases. Applicants invention cannot be reduced to simply one element of the method. It is the sum of all the elements that make up the claimed invention. Hendrickson et al teaching of a washing step is not at all a teaching of forming an antibody:target molecule:aptamer ternary complex and washing the same to remove nucleases that would negatively effect the utility of using aptamers.

Further, the Examiner, in an effort to rebut Applicants' earlier arguments submitted December 9, 2002 (at page 4), incorporated herein by reference, contends that the Gold et al. reference teaches a washing step that must result in amplifiable nucleic acids. It is important to note that Applicants' Claim 46 states in step (c) that the washing is for the purpose removing nucleases from the ternary complex. Gold et al. does not teach this important step. An end goal of obtaining "amplifiable nucleic acids" can relate to any number of factors. In fact, the section of Gold et al. referred to by the Examiner (col. 24, line 53 to col. 25, line 9) quite clearly relates to a process for releasing aptamers from the target. Importantly, this section of the patent reference is directed to a process for obtaining aptamers, not using them. Furthermore, Gold et al. specifically referred to "chemical degradation," which can be interpreted as degradation caused by chemicals that may be present in an extraction solution (arguably distinct from degradation caused by the presence of nuclease). Finally, considering the prior art teachings of concern that aptamers are particularly susceptible to nucleases, it would be expected that had Gold et al. contemplated the use of aptamers in a nuclease-containing sample, they would have made an explicit reference to that concern. That is not the case in Gold et al. As indicated above, the Gold et al. reference is not washing out of concern for nuclease effects on the utility of aptamers, Gold et al. is washing to release aptamers from the target for the purpose of obtaining aptamers, not using them.

It is therefore clear that neither Hendrickson et al. or Gold et al. considered alone or in combination provide a teaching of the whole of the claimed invention and in fact do not even teach the single step in Claim 46 of washing to remove nucleases from an antibody:target molecule:aptamer ternary complex.

The present rejection and combination of the references cited is not supported by a teaching to combine or a likelihood of success in any of the cited references. The rejection is the result of using the claimed invention as a template and filling in the blanks with elements as necessary. An obviousness rejection on that basis according to the Federal Circuit is not permissible. Accordingly, withdrawal of the rejection is respectfully requested.

Claims 2, 4, 5, 8-14, 17-20 and 46 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cubicciotti (U.S. Patent 6,287,765) in view of Gibson et al. (Genome Methods 1996, 6: 995-1001). Applicants respectfully traverse the rejection.

The Examiner contends that Cubicciotti teaches the required elements of the claimed invention but admits that Cubicciotti fails to teach the use of real-time PCR as is required by the Applicants' invention. Similar to the earlier cited reference of Hendrickson et al., Cubicciotti does not teach forming an antibody:target molecule:aptamer ternary complex and washing the same to remove nucleases that would negatively effect the utility of using aptamers. While the passage of Cubicciotti, cited by the Examiner, discusses using aptamers, there is no suggestion that Cubicciotti recognized or provided for the washing of an antibody:target molecule:aptamer ternary complex to remove nuclease. Furthermore, the sole basis for combining the references as recited in the Official Action at page 9, middle of first paragraph, is that real-time PCR using detectable probes was well known and practiced in the art at the time as evidenced by Gibson et al. Here also, the references cited do not teach or suggest that the Cubicciotti reference can or should be modified to incorporate the teaching of Gibson et al. There is neither a teaching to

combine or a suggestion that such a combination would be successful. The combination of references is again the result of impermissible hindsight. Accordingly, withdrawal of the rejection is respectfully requested.

Claims 24-45 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cubicciotti (U.S. Patent 6,287,765) in view of Gibson et al. (Genome Methods 1996, 6: 995-1001) as applied to Claim 46 and further in view of Hendrickson et al. (Nucleic Acids Research, 1995, 23(3):522-529). Applicants respectfully traverse the rejection.

Applicants' above remarks regarding the rejection of Claims 2, 4, 5, 8-14, 17-20 and 46 under 35 U.S.C. § 103(a) apply equally to the immediate rejection of Claims 24-45. The specific sensitivity requirements of the Applicant's invention are not taught as being within the capability of the Cubicciotti reference. That reference further does not suggest such levels of sensitivity are possible. Still, the combination of Hendrickson et al. with a teaching of higher levels of sensitivity have been combined simply using the Applicants' invention as a template. There is no teaching or suggestion in the references themselves that would lead one of ordinary skill in the art to modify the reference disclosures so as to arrive at the claimed invention other than the template provided by Applicants' own disclosure. An obviousness rejection on that basis is improper. Accordingly, withdrawal of the rejection is respectfully requested.

Each of the Examiner's rejections recited above have a common deficiency that renders the rejections improper individually as a *prima facie* case of obviousness. Without a specific teaching or suggestion from within the references cited by the Examiner, the obviousness rejections are improper and should be withdrawn.

CONCLUSION

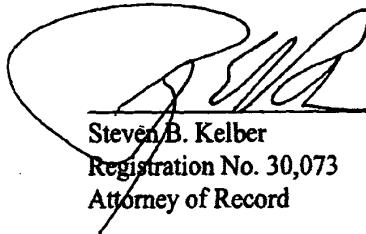
In light of the above, Applicants believe that this application is now in condition for

allowance and therefore requests favorable consideration.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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AL-SITE CORPORATION and MAGNIVISION, INC., Plaintiffs-Appellants, v. VSI INTERNATIONAL, INC. and MYRON ORLINSKY, Defendants-Cross Appellants.

97-1593, 98-1108

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

174 F.3d 1308; 1999 U.S. App. LEXIS 5802; 50 U.S.P.Q.2D (BNA) 1161

March 30, 1999, Decided

SUBSEQUENT HISTORY: [**1] Rehearing Denied and Suggestion for Rehearing En Banc Declined May 25, 1999, Reported at: 1999 U.S. App. LEXIS 11945.

PRIOR HISTORY:Appealed from: U.S. District Court for the Southern District of Florida. Senior Judge C. Clyde Atkins.

DISPOSITION: AFFIRMED-IN-PART and REVERSED-IN-PART.

CASE SUMMARY

PROCEDURAL POSTURE: Although it ostensibly prevailed, plaintiff appealed a judgment of the United States District Court for the Southern District of Florida, which found that defendant company had infringed several patents claiming specific hangers for displaying non-prescription eyeglasses, found trademark and trade dress infringement and unfair competition, and found defendant chairman personally liable for the violations. Defendants cross-appealed.

OVERVIEW: Plaintiff, a non-prescription eyeglass seller, sued another seller, defendant company, and its chairman. The trial court found that defendant company had infringed several patents claiming specific hangers for displaying non-prescription eyeglasses, found trademark and trade dress infringement and unfair competition, and found defendant chairman personally liable. Although it ostensibly prevailed, plaintiff appealed the district court's claim construction that one of defendant's products did not literally infringe three patents. Defendants cross-appealed. The court found that the district court erred by interpreting several of the claim elements in the three patents as mean-plus-function elements subject to 35 U.S.C.S. § 112, P 6. The court corrected the claim construction, and under that construction affirmed the patent infringement finding. However, the court found that the record did not contain substantial evidence to support the district court's findings concerning trademark and trade dress infringement and unfair competition. Absent a specifically defined, color-definite, and stable visual

appearance, plaintiff's alleged trade dress could not receive protection.

OUTCOME: After correcting the claim construction of the district court, the court affirmed the patent infringement finding. After ruling that the record did not contain substantial evidence to support the district court's findings, the court reversed the judgments of trademark and trade dress infringement, unfair competition, or personal liability for defendant chairman.

CORE TERMS: patent, eyeglass, hanger, trade dress, infringement, tag, display, color, trademark, secondary meaning, means-plus-function, consumer, hole, coding, invention, skill, pair, unfair competition, glue, fastening, infringe, frame, literal, functional, literally, infringed, similarity, distinctiveness, obviousness, substantial evidence

LexisNexis(TM) HEADNOTES - Core Concepts

Civil Procedure > Appeals > Standards of Review > Substantial Evidence Rule

[HN1]The court reviews the district court's denials of the motions for judgment as a matter of law using the same standards applied by the district court. The court will only upset a jury verdict if the record lacks substantial evidence to support the verdict.

Patent Law > Infringement > Doctrine of Equivalents

[HN2]The proper test for determining equivalence under 35 U.S.C.S. § 112, P 6 (1994), is whether the differences between the structure in the accused device and any disclosed in the specification are insubstantial. The question of known interchangeability is an important factor in determining equivalence.

Patent Law > Jurisdiction & Review > Standards of Review

[HN3]The court reviews the district court's patent claim interpretation without deference.

Patent Law > Infringement > Claim Interpretation

Patent Law > Infringement > Doctrine of Equivalents

[HN4]The court has delineated several rules for claim drafters to invoke the strictures of 35 U.S.C.S. § 112, P 6. Specifically, if the word "means" appears in a claim element in combination with a function, it is presumed to be a means-plus-function element to which § 112, P 6 applies. Nevertheless, according to its express terms, § 112, P 6 governs only claim elements that do not recite sufficient structural limitations. Therefore, the presumption that § 112, P 6 applies is overcome if the claim itself recites sufficient structure or material for performing the claimed function. Where a claim recites a function, but then goes on to elaborate sufficient structure, material, or acts within the claim itself to perform entirely the recited function, the claim is not in means-plus-function format.

Patent Law > Infringement > Claim Interpretation

Patent Law > Infringement > Doctrine of Equivalents

[HN5]Although use of the phrase "means for" (or "step for") is not the only way to invoke 35 U.S.C.S. § 112, P 6 that terminology typically invokes § 112, P 6 while other formulations generally do not. Therefore, when an element of a claim does not use the term "means," treatment as a means-plus-function claim element is generally not appropriate. However, when it is apparent that the element invokes purely functional terms, without the additional recital of specific structure or material for performing that function, the claim element may be a means-plus-function element despite the lack of express means-plus-function language. Merely because an element does not include the word "means" does not automatically prevent that element from being construed as a means-plus-function element.

Patent Law > Infringement > Claim Interpretation

Patent Law > Infringement > Doctrine of Equivalents

[HN6]Equivalents under 35 U.S.C.S. § 112, P 6 is an application of the doctrine of equivalents in a restrictive role, narrowing the application of broad literal claim elements. Section 112, P 6 was enacted as a targeted cure to a specific problem. The added provision, however, is silent on the doctrine of equivalents as applied where there is no literal infringement.

Patent Law > Infringement > Claim Interpretation

Patent Law > Infringement > Doctrine of Equivalents

[HN7]Title 35 U.S.C.S. § 112, P 6 recites a mandatory procedure for interpreting the meaning of a means- or step-plus-function claim element. These claim limitations shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. Thus, § 112,

P 6 procedures restrict a functional claim element's broad literal language to those means that are equivalent to the actual means shown in the patent specification. Section 112, P 6 restricts the scope of a functional claim limitation as part of a literal infringement analysis. Thus, an equivalent under § 112, P 6 informs the claim meaning for a literal infringement analysis. The doctrine of equivalents, on the other hand, extends enforcement of claim terms beyond their literal reach in the event there is equivalence between the elements of the accused product or process and the claimed elements of the patented invention.

Patent Law > Infringement > Claim Interpretation

Patent Law > Infringement > Doctrine of Equivalents

[HN8]One important difference between 35 U.S.C.S. § 112, P 6 and the doctrine of equivalents involves the timing of the separate analyses for an "insubstantial change." A structural equivalent under § 112 must have been available at the time of the issuance of the claim. An equivalent structure or act under § 112 cannot embrace technology developed after the issuance of the patent because the literal meaning of a claim is fixed upon its issuance. An "after arising equivalent" infringes, if at all, under the doctrine of equivalents. Thus, the temporal difference between patent issuance and infringement distinguish an equivalent under § 112 from an equivalent under the doctrine of equivalents.

Patent Law > Infringement > Claim Interpretation

Patent Law > Infringement > Doctrine of Equivalents

[HN9]An equivalent structure or act under 35 U.S.C.S. § 112 for literal infringement must have been available at the time of patent issuance while an equivalent under the doctrine of equivalents may arise after patent issuance and before the time of infringement. An "after-arising" technology could thus infringe under the doctrine of equivalents without infringing literally as a § 112, P 6 equivalent. Furthermore, under § 112, P 6, the accused device must perform the identical function as recited in the claim element while the doctrine of equivalents may be satisfied when the function performed by the accused device is only substantially the same.

Patent Law > Infringement > Claim Interpretation

Patent Law > Infringement > Doctrine of Equivalents

[HN10]Although 35 U.S.C.S. § 112, P 6 and the doctrine of equivalents are different in purpose and administration, a finding of a lack of literal infringement for lack of equivalent structure under a means-plus-function limitation may preclude a finding

of equivalence under the doctrine of equivalents. Both equivalence analyses, after all, apply similar analyses of insubstantiality of the differences. This confluence occurs because infringement requires, either literally or under the doctrine of equivalents, that the accused product or process incorporate each limitation of the claimed invention. Therefore, if an accused product or process performs the identical function and yet avoids literal infringement for lack of a § 112, P 6 structural equivalent, it may well fail to infringe the same functional element under the doctrine of equivalents.

Patent Law > Infringement > Burdens of Proof

[HN11]Issued patents have a strong presumption of validity in infringement proceedings. Hence, an accused infringer who defends on grounds of patent invalidity bears the burden of showing patent invalidity by clear and convincing evidence.

Patent Law > Nonobviousness > Tests & Proof of Obviousness

Patent Law > Infringement > Burdens of Proof

[HN12]In a challenge based on obviousness under 35 U.S.C.S. § 103, the person alleging invalidity must show prior art references which alone or combined with other references would have rendered the invention obvious to one of ordinary skill in the art at the time of invention. The presumption of validity under 35 U.S.C.S. § 282 carries with it a presumption that the Patent and Trademark Office (PTO) examiner did his duty and knew what claims he was allowing. Therefore, the challenger's burden is especially difficult when the prior art was before the PTO examiner during prosecution of the application.

Patent Law > Nonobviousness > Tests & Proof of Obviousness

[HN13]The party seeking patent invalidity based on obviousness must also show some motivation or suggestion to combine the prior art teachings. A suggestion or motivation to combine generally arises in the references themselves, but may also be inferred from the nature of the problem or occasionally from the knowledge of those of ordinary skill in the art.

Patent Law > Nonobviousness > Tests & Proof of Obviousness

[HN14]The level of skill in the art is a prism or lens through which a judge or jury views the prior art and the claimed invention. This reference point prevents these deciders from using their own insight or, worse yet, hindsight, to gauge obviousness.

Patent Law > Nonobviousness > Tests & Proof of Obviousness

[HN15]The level of skill in the art is a factual determination.

Governments > Courts > Creation & Organization

[HN16]For areas of law, such as trademark and trade dress infringement, which are not unique to the United States Court of Appeals for the Federal Circuit's jurisdiction, the court applies the law of the pertinent regional circuit.

Civil Procedure > Appeals > Standards of Review > Substantial Evidence Rule

Civil Procedure > Appeals > Standards of Review > De Novo Review

[HN17]Under eleventh circuit law, a finding of trademark and trade dress infringement is a question of fact. A jury verdict of trademark or trade dress infringement is therefore reviewed for substantial evidence. Legal determinations of the district court, however, receive no deference on review.

Trademark Law > Federal Unfair Competition Law > Trade Dress Protections

[HN18]Trade dress protection embraces the total image of the product including such factors as the size, shape, and color of the product's packaging and appearance. To prove trade dress infringement, the plaintiff must show: (1) the inherent distinctiveness or secondary meaning of its trade dress, (2) the essential nonfunctionality of its trade dress, and (3) the likelihood of consumer confusion as to origin, sponsorship, or approval due to similarity between its and the defendant's trade dress. Because this is a conjunctive test, failure to prove even one of these elements precludes a showing of trade dress infringement. Therefore, the defendant can secure a summary judgment of noninfringement by demonstrating that the plaintiff cannot show any element of the cause of action.

Trademark Law > Federal Unfair Competition Law > Trade Dress Protections

[HN19]Distinctive trade dress enables consumers to distinguish a product from others and identify that product with its source. The eleventh circuit gauges distinctiveness based on whether trade dress is a common basic shape or design, whether it is unique or unusual in a particular field, and whether it is a mere refinement of a commonly adopted and well-known form of ornamentation for a particular class of goods viewed by the public as a dress or ornamentation for the goods. Trade dress can also satisfy this requirement by showing secondary meaning, or a connection in the consumer's mind between the mark and the product's producer, whether that producer is known or unknown.

Trademark Law > Federal Unfair Competition Law > Trade Dress Protections

[HN20]The plaintiff may show secondary meaning in several ways. The plaintiff may show secondary meaning with consumer surveys and with evidence of lengthy and uniform display of the dress. The plaintiff may also show secondary meaning with evidence of the plaintiff's efforts, usually through advertising, to establish in the minds of the consumers a connection between the trade dress and its product. Finally, the plaintiff may use other evidence showing consumers' association of the trade dress with the plaintiff or its product to prove secondary meaning.

Trademark Law > Federal Unfair Competition Law > Trade Dress Protections

[HN21]Trade dress must be primarily nonfunctional. A trade dress is functional if it is essential to the use or purpose of the article or if it affects the cost or quality of the article, such that its protection would place a competitor at a significant disadvantage.

Trademark Law > Federal Unfair Competition Law > Trade Dress Protections

[HN22]Trade dress protection requires evidence of a likelihood of confusion between the plaintiff's and the defendant's trade dress. Determining whether a likelihood of confusion exists requires weighing several factors: (1) the nature of the plaintiff's mark, (2) the similarity of the marks, (3) the similarity of the products the marks represent, (4) the similarity of the parties' retail outlets and customers, (5) the similarity of the parties' advertising, (6) the defendant's intent to copy or imitate the plaintiff's mark, and (7) the extent of actual confusion.

Trademark Law > Federal Unfair Competition Law > Trade Dress Protections

[HN23]Absent a specifically defined, color-definite, and stable visual appearance, an alleged trade dress cannot receive protection.

Trademark Law > Federal Unfair Competition Law > Trade Dress Protections

[HN24]Color coding cannot act as an indicator of source because it is primarily functional.

Trademark Law > Federal Unfair Competition Law > Trade Dress Protections

[HN25]When similar packaging can be purchased by other companies and is publicly available, it defies simple logic to suggest that the packaging was inherently distinctive.

Trademark Law > Likelihood of Confusion > Consumer Confusion

Trademark Law > Likelihood of Confusion > Mark Similarity

[HN26]To prove trademark infringement, a trademark owner must show a likelihood that consumers would confuse the defendant's mark with the protected mark. The eleventh circuit identifies several factors which contribute to a likelihood of confusion finding: (1) the nature of the plaintiff's mark, (2) the similarity of the marks, (3) the similarity of the products represented by the marks, (4) the similarity of the retail outlets and consumers, (5) the nature and extent of the parties' advertising, (6) the defendant's intent to copy the plaintiff's mark, and (7) the extent of actual confusion. Other relevant factors include the strength of the marks, the number and nature of similar marks in use on similar goods, the nature and extent of any actual confusion and the length of time during and conditions under which there has been concurrent use without evidence of actual confusion.

Trademark Law > Likelihood of Confusion > Consumer Confusion

Trademark Law > Likelihood of Confusion > Mark Similarity

[HN27]Similarity of the marks is a hallmark of consumer confusion. In evaluating the similarity of marks, the court must consider the appearance, sound and meaning of the marks, as well as the manner in which they are displayed.

Business & Corporate Entities > Corporations > Directors & Officers > Management Duties & Liabilities

[HN28]Title 35 of the United States Code authorizes a finding that an officer of a corporation is personally liable for the corporation's acts of infringement. Personal liability under 35 U.S.C.S. § 271(a) (1994), however, requires sufficient evidence to justify piercing the corporate veil.

COUNSEL: Peter T. Cobrin, Cobrin, Gittes & Samuel, of New York, New York, argued for plaintiffs-appellants. With him on the brief was Stephen E. Nagin, Nagin, Gallop & Figueredo, P.A., of Miami, Florida. Of counsel was Oren J. Warshavsky.

Donald W. Rupert, Mayer, Brown & Platt, of Chicago, Illinois, argued for defendants-cross appellants. With him on the brief were Robert S. Rigg and Lisa A. Schneider. Of counsel on the brief were Richard L. Horn and Heather A. Libbey, Wilson & McIlvaine, of Chicago, Illinois. Of counsel was Myles G. Cypen, Cypen & Cypen, of Miami, Florida.

JUDGES: Before MAYER, Chief Judge, RICH, and RADER, Circuit Judges.

OPINIONBY: RADER

OPINION: [*1314] RADER, Circuit Judge.

This case involves patent, trademark, and trade dress infringement. After the United States District Court for the Southern District of Florida interpreted the claims, a jury found that VSI International, Inc. (VSI) had infringed several patents claiming specific hangers for displaying non-prescription eyeglasses. The jury also found trademark and trade dress [*2] infringement, and unfair competition. In addition, the jury found VSI's chairman and CEO, Myron Orlinsky, personally liable for these violations. Although Al-Site Corporation, now Magnivision, Inc. (Magnivision) n1, prevailed on infringement, it appeals the district court's claim construction. On review, this court discerns errors in claim construction. Under a correct claim construction, the record contains substantial evidence that VSI infringed Magnivision's patents. Therefore, this court affirms the patent infringement finding. The record, however, does not contain substantial evidence to support the jury's findings of trademark and trade dress infringement, unfair competition, or personal liability for Myron Orlinsky. Therefore, this court reverses those judgments.

-----Footnotes-----

n1 After this litigation began, American Greetings Corporation acquired Al-Site Corporation, the named plaintiff in this case, and merged it with Magni-Tech Corporation to form Magnivision, Inc. The parties and this court, therefore, refer to the plaintiff as Magnivision.

-----End Footnotes-----

[**3]

I.

Magnivision and VSI both sell non-prescription eyeglasses. Magnivision is the assignee of U.S. Patent Nos. 4,976,532 (the '532 patent), 5,144,345 (the '345 patent), 5,260,726 (the '726 patent), and 5,521,911 (the '911 patent). These patents claim technology for displaying eyeglasses on racks. The claimed inventions allow consumers to try on eyeglasses and return them to the rack without removing them from their display hangers.

Magnivision sued VSI, as well as its chairman and CEO, Myron Orlinsky, in his individual capacity, for

infringement of the Magnivision patents, for infringement of Magnivision's MAGNIVISION trademark and the trade dress of various products, and for unfair competition under Florida law. Six years after filing, the district court conducted a jury trial. After interpreting the claims, the district court instructed the jury to apply its construction of the claims to determine infringement.

The jury determined that one of VSI's products (the Version 1 hanger tag) literally infringed the '532 patent. The jury also determined that a second VSI product (the Version 2 hanger tag) did not literally infringe the '345, '726, and '911 patents, but did infringe those [*4] patents under the doctrine of equivalents. The jury further concluded that the Magnivision patents were not invalid under 35 U.S.C. § 103. Additionally, the jury found that VSI had infringed Magnivision's trademark and trade dress and had engaged in unfair competition. Finally, the jury imposed personal liability on Myron Orlinsky, making him jointly and severally liable for the damage award.

Following the jury verdict, Magnivision moved for judgment as a matter of law that the Version 2 hanger tag literally infringed the '345, '726, and '911 patents. VSI's post-trial motion sought to reverse all of the jury's determinations. The district [*1315] court denied both motions and both parties appeal. Specifically, Magnivision challenges the district court's claim construction of the '345, '726, and '911 patents, arguing that the claims, if properly construed, would have been literally infringed by VSI's Version 2 hanger tag. VSI, on the other hand, contends that the district court's claim construction was correct but challenges the jury's determinations for lack of substantial evidence to support a verdict.

II.

[HN1] This court reviews the district court's denials of the motions for judgment as [*5] a matter of law using the same standards applied by the district court. See *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 975, 34 U.S.P.Q.2D (BNA) 1321, 1326 (Fed. Cir. 1995), aff'd, 517 U.S. 370, 116 S. Ct. 1384, 38 U.S.P.Q.2D (BNA) 1461, 134 L. Ed. 2d 577 (1996). This court will only upset a jury verdict if the record lacks substantial evidence to support the verdict. See *Motorola, Inc. v. Interdigital Tech. Corp.*, 121 F.3d 1461, 1466, 43 U.S.P.Q.2D (BNA) 1481, 1484 (Fed. Cir. 1997); *Markman*, 52 F.3d at 975.

Literal Infringement of the '532 patent

The jury determined that the Version 1 hanger tag literally infringes claims 8, 9, 14, 15, and 17 of the '532 patent. Claim 8, the independent claim from which the other infringed claims depend, claims the

combination of a pair of eyeglasses and a hanger means for removably mounting the eyeglasses on a cantilevered support. The claim itself gives a more structural definition of the hanger means as "including a body having aperture means adapted" for suspending the hanger and eyeglasses on the cantilevered support. Additionally, the hanger means includes an extension projecting from the bottom edge portion of the hanger body. This extension encircles [**6] the nose bridge of the eyeglasses. The claim specifies that "fastening means in engagement with said extension" hold the extension in a closed loop. Figure 1 from the '532 patent illustrates these claimed features:

[SEE FIGURE 1 IN ORIGINAL]

The district court determined that the "fastening means" was a means-plus-function element subject to the interpretation requirements of 35 U.S.C. § 112, P 6 (1994). Consistent with that determination, the trial court instructed the jury that "the fastening means . . . is either a rivet or a button and hole arrangement as shown in the '532 patent or the structural equivalents thereof." Neither party challenges this part of the district court's claim construction.

[*1316] On appeal, VSI contends that its Version 1 hanger tag does not infringe because it does not include the "fastening means" required by claim 8. VSI's Version 1 hanger tag is a one-piece paper sticker having two large portions connected by a narrow extension. The entire back of the tag, including the extension, is coated with an adhesive. Backing paper covers the adhesive to prevent undesired adhesion. In use, a merchant removes the backing paper from the large portions of the tag. [**7] The extension (still covered with backing paper) then wraps around the nose bridge of the glasses. This wrapping glues the large portions together. In use, therefore, glue secures the two large portions of the tag to each other, leaving the narrow extension of the tag wrapped around the bridge of the eyeglasses.

The adhesive used by VSI is not identical to the fastening structure (namely, a rivet or button) described in the '532 patent. The jury, however, applying the rules of § 112, P 6, determined that the VSI adhesive was equivalent to the structure disclosed in the specification. Accordingly, the jury returned a verdict of literal infringement of the '532 patent. VSI argues that substantial evidence does not support the jury's finding of literal infringement.

VSI first challenges the jury determination that adhesive is structurally equivalent to the mechanical fasteners disclosed in the specification of the '532 patent. Magnivision's technical expert, Mr. Anders, testified that, for one of ordinary skill in the art, it

would be an insubstantial change "to substitute a rivet for a staple or for glue or for any other method that's standard in the [point of purchase] industry [**8] to maintain this loop as a closed loop." See *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1309, 46 U.S.P.Q.2D (BNA) 1752, 1756-57 (Fed. Cir. 1998) ("[HN2]The proper test [for determining equivalence under § 112, P 6] is whether the differences between the structure in the accused device and any disclosed in the specification are insubstantial. . . . The question of known interchangeability is . . . an important factor in determining equivalence [under § 112, P 6]."). Mr. Anders further testified that the use of glue "in between the two layers of the body . . . is an insubstantial change from the other structure . . . which was one of a rivet. People in point of purchase displays use glue or rivets or staples to accomplish the same function." But see *Chiuminatta*, 145 F.3d at 1309 ("Almost by definition, two structures that perform the same function may be substituted for one another. The question of known interchangeability is not whether both structures serve the same function, but whether it was known that one structure was an equivalent of another."). Mr. Anders additionally testified that "equivalent fastening means could be a rivet, glue or staple [**9] or some such similar [structure]." This testimony constitutes sufficient evidence to sustain the jury's verdict that persons of ordinary skill in the art consider glue an equivalent structure to those disclosed in the specification for maintaining a closed loop.

As a fallback position, VSI argues that, even if the glue is an equivalent of the rivet or button, Magnivision presented no evidence that the glue was "in engagement" with the extension as claim 8 requires. On cross examination, Mr. Anders identified the middle section of the Version 1 hanger tag as the "extension" element. Mr. Anders also identified the glue as the "fastening means" element. Because VSI leaves the backing paper on its extension (presumably to prevent the tag from adhering to the eyeglasses), VSI argues that its extension does not engage the fastening means as required by the claims of the '532 patent.

VSI's argument is unpersuasive. The claims of the '532 patent only require that the fastening means be "in engagement with" the extension. As noted above, VSI coats the extension of its Version 1 hanger tag with glue - the fastening means identified by Mr. Anders. Furthermore, Mr. Anders' testimony explains [**10] that the extension and the glued portions are one integral piece. The jury could have interpreted [*1317] his testimony to mean that the extension includes more than the narrow, middle portion of the Version 1 tag. Under this interpretation, the extension would also

directly engage the glue fastening means. Alternatively, the jury could have determined that the extension is only the narrow portion of the Version 1 tag, but that the fastening means includes one of the two portions of the tag body in addition to the glue. Under any of these reasonable views of the accused product, the extension of the Version 1 hanger tag is in engagement with the glue fastening means as required by the claims.

As the finder of fact, the jury receives deference for its function of weighing witness demeanor, credibility, and meaning. See *Anderson v. City of Bessemer City, North Carolina*, 470 U.S. 564, 575, 84 L. Ed. 2d 518, 105 S. Ct. 1504 (1985) (factfinder entitled to deference on credibility determinations). Substantial evidence therefore supports the jury's verdict that VSI's Version 1 hanger tag literally infringes the '532 patent.

Infringement of the '345, '726, and '911 Patents

The jury determined [**11] that VSI's Version 2 hanger tag and display rack did not literally infringe claims 1 and 2 of the '345 patent; claims 1 and 2 of the '726 patent; or claims 1, 2, and 3 of the '911 patent. The jury nevertheless found infringement of each of these claims under the doctrine of equivalents. Magnivision argues that the district court misconstrued these claims, and that, under the proper claim construction, VSI's products literally infringe these claims as a matter of law. VSI, on the other hand, embraces the district court's claim construction and argues that prosecution history estoppel precludes a finding of infringement under the doctrine of equivalents.

Claim 1 of the '345 patent and claim 1 of the '726 patent are similar. Both claim "the combination of an eyeglass display member and an eyeglass hanger member." In each of these claims, this combination includes a "display member" with "cantilever support means" and "an eyeglass hanger member for mounting a pair of eyeglasses." Both claims further define the structure of the eyeglass hanger member. Claim 1 of the '345 patent describes the eyeglass hanger member as "made from flat sheet material," and having an "opening means formed [**12] . . . below [its] upper edge." According to claim 1 of the '726 patent, the eyeglass hanger member has "an attaching portion attachable to a portion of said frame of said pair of eyeglasses to enable the temples of the frame [to be opened and closed]." Similarly, claim 2 of the '726 patent encompasses a "method of displaying eyeglass/hanger combinations . . . the eyeglass hangers having an attaching portion attached to a portion of the frame of an associated pair of eyeglasses."

Claims 1, 2, and 3 of the '911 patent encompass a "combination of an eyeglass display member and an eyeglass contacting member." The '911 patent further describes the structure of the "eyeglass contacting member" as "having an encircling portion adapted to encircle a part of said frame of said pair of eyeglasses."

The district court construed the "eyeglass hanger member" element of the '345 patent as a means-plus-function claim element subject to § 112, P 6. Accordingly, the district court instructed the jury that "the 'eyeglass hanger member for mounting a pair of eyeglasses' [in claim 1 of the '345 patent] is the body of the hanger disclosed in the '345 patent and its drawings and the structural [**13] equivalents thereof." The district court similarly interpreted the "eyeglass hanger member" element of the '726 patent. The district court instructed the jury that "the 'eyeglass hanger member for mounting a pair of eyeglasses' [in claim 1 of the '726 patent] is the hanger disclosed in the '726 patent and its drawings as having a body, an aperture, and an attaching portion and the structural equivalents thereof."

[**1318] With respect to the '911 patent, the district court concluded that the "eyeglass contacting member" was a means-plus-function element. The district court therefore instructed the jury that the "eyeglass contacting member" is "the hanger disclosed in the '911 patent and its drawings having a body and an aperture and an 'encircling portion', and the structural equivalents thereof."

[HN3] This court reviews the district court's claim interpretation without deference. See *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454-56, 46 U.S.P.Q.2D (BNA) 1169, 1172-75 (Fed. Cir. 1998) (en banc); *Markman*, 52 F.3d at 979-81. [HN4] This court has delineated several rules for claim drafters to invoke the strictures of 35 U.S.C. § 112, P 6. Specifically, if the word "means" appears in a claim element [**14] in combination with a function, it is presumed to be a means-plus-function element to which § 112, P 6 applies. See *Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1427, 44 U.S.P.Q.2D (BNA) 1103, 1109 (Fed. Cir. 1997); *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583, 39 U.S.P.Q.2D (BNA) 1783, 1785 (Fed. Cir. 1996). Nevertheless, according to its express terms, § 112, P 6 governs only claim elements that do not recite sufficient structural limitations. See 35 U.S.C. § 112, P 6. Therefore, the presumption that § 112, P 6 applies is overcome if the claim itself recites sufficient structure or material for performing the claimed function. See *Sage*, 126 F.3d at 1427-28 ("Where a claim recites a function, but then goes on to elaborate sufficient structure, material, or acts within the claim itself to perform entirely the

recited function, the claim is not in means-plus-function format."); York Prods., Inc. v. Central Tractor Farm & Family Ctr., 99 F.3d 1568, 1574, 40 U.S.P.Q.2D (BNA) 1619, 1623 (Fed. Cir. 1996); Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531, 41 U.S.P.Q.2D (BNA) 1001, 1006 (Fed. Cir. 1996).

[HNS] Although use of the phrase "means for" (or "step for") is not the only [**15] way to invoke § 112, P 6, that terminology typically invokes § 112, P 6 while other formulations generally do not. See Greenberg, 91 F.3d at 1583-84. Therefore, when an element of a claim does not use the term "means," treatment as a means-plus-function claim element is generally not appropriate. See Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 1213-15, 48 U.S.P.Q.2D (BNA) 1010, 1016-18 (Fed. Cir. 1998). However, when it is apparent that the element invokes purely functional terms, without the additional recital of specific structure or material for performing that function, the claim element may be a means-plus-function element despite the lack of express means-plus-function language. See, e.g., Cole, 102 F.3d at 531 ("Merely because an element does not include the word 'means' does not automatically prevent that element from being construed as a means-plus-function element."); Mas-Hamilton, 156 F.3d at 1213-15 (interpreting "lever moving element" and "movable link member" under § 112, P 6).

Under this established analytical framework, the "eyeglass hanger member" elements in the claims of both the '345 and the '726 patents do not invoke § 112, P 6. In the first [**16] place, these elements are not in traditional means-plus-function format. The word "means" does not appear within these elements. Moreover, although these claim elements include a function, namely, "mounting a pair of eyeglasses," the claims themselves contain sufficient structural limitations for performing those functions. As noted above, claim 1 of the '345 patent describes the eyeglass hanger member as "made from flat sheet material" with an "opening means formed . . . below [its] upper edge." This structure removes this claim from the purview of § 112, P 6. Similarly, according to claim 1 of the '726 patent, the eyeglass hanger member has "an attaching portion attachable to a portion of said frame of said pair of eyeglasses to enable the temples of the frame [to be opened and closed]." This structure also precludes treatment as a means-plus-function claim element. The district court [*1319] therefore improperly restricted the "eyeglass hanger member" in these claims to the structural embodiments in the specification and their equivalents.

The district court also erred in interpreting the "attaching portion attachable to a portion of said frame

of said pair of eyeglasses" element [**17] of claim 1 of the '726 patent as a means-plus-function element. It instructed the jury that the "attachable portion" is "a mechanically fastened loop that goes around the nose bridge of the glasses as disclosed in the specification, or the structural equivalent thereof." Because this claim element is also not in traditional means-plus-function form and supplies structural, not functional, terms, the trial court erred by applying § 112, P 6 to this claim element. This error caused the district court to incorporate unduly restrictive structural limitations into the claim.

For reasons similar to those discussed above with respect to the claim elements of the '345 and the '726 patents, the "eyeglass contacting member" element of the '911 patent claims is also not a means-plus-function element. Again, this claim element is not in traditional means-plus-function form. Furthermore, the claim itself recites sufficient structure for performing the recited function. Specifically, claim 1 of the '911 patent describes the "eyeglass contacting member" as "having an encircling portion adapted to encircle a part of said frame of said pair of eyeglasses to enable the temples of the frame to be selectively [**18] [opened and closed]." Similarly, claim 3 of the '911 patent describes the "eyeglass contacting member" as "having an attaching portion attachable to a portion of said frame of said eyeglasses. Therefore, the district court erred by applying § 112, P 6 to these claim elements.

Magnivision also complains that the district court erred in its construction of the language "means for securing a portion of said frame of said eyeglasses to said hanger member" in claim 1 of the '345 patent. With respect to this element, the district court instructed the jury that "the 'means for securing' limitation is a mechanically fastened loop that goes around the nose bridge of the glasses . . . or an equivalent thereof." The district court went on, however, to instruct the jury that "the means for securing can be formed from a separate extension or integral extension and includes either the rivet fastener or the button and hole fastener." Magnivision argues that the district court should have included the phrase "or equivalents thereof" after "button and hole fastener" in its instruction to the jury. Absent this and the other claimed errors in the district court's interpretation of claim 1 of the [**19] '345 patent, Magnivision argues that the jury would have found literal infringement rather than infringement under the doctrine of equivalents.

The "means for securing" claim element is in conventional means-plus-function format without specific recital of structure and therefore invokes § 112, P 6. The jury's finding of infringement of claim 1 of the '345 patent under the doctrine of equivalents

- ipicates that the jury found every element of the claim literally or equivalently present in the accused device.
- The question before this court, therefore, is whether the jury's finding that the accused structure was equivalent to the "means for securing" element under the doctrine of equivalents, also indicates that it is equivalent structure under § 112, P 6.

This court has on several occasions explicated the distinctions between the term "equivalents" found in § 112, P 6 and the doctrine of equivalents. See, e.g., Valmont Indus., Inc. v. Reinke Mfg. Co., 983 F.2d 1039, 1042-44, 25 U.S.P.Q.2D (BNA) 1451, 1453-56 (Fed. Cir. 1993); Chiuminatta, 145 F.3d at 1310; Alplex Computer Corp. v. Nintendo Co., 102 F.3d 1214, 1222, 40 U.S.P.Q.2D (BNA) 1667, 1673-74 (Fed. Cir. 1996); Dawn Equip. Co. [**20] v. Kentucky Farms Inc., 140 F.3d 1009, 1018-23, 46 U.S.P.Q.2D (BNA) 1109, 1115-18 (Fed. Cir. 1998) (Plager, J., additional views) (Newman, J., additional views) (Michel, J., additional views). Indeed, the [**1320] Supreme Court recently acknowledged distinctions between equivalents as used in § 112, P 6 and the doctrine of equivalents. See Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 117 S. Ct. 1040, 1048, 41 U.S.P.Q.2D (BNA) 1865, 1870-71, 137 L. Ed. 2d 146 (1997) ("[HN6]Equivalents under § 112, P 6] is an application of the doctrine of equivalents in a restrictive role, narrowing the application of broad literal claim elements. [Section 112, P 6] was enacted as a targeted cure to a specific problem The added provision, however, is silent on the doctrine of equivalents as applied where there is no literal infringement.")

[HN7]Section 112, P 6 recites a mandatory procedure for interpreting the meaning of a means- or step-plus-function claim element. These claim limitations "shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. § 112, P 6. Thus, § 112, P 6 procedures restrict a functional claim [**21] element's "broad literal language . . . to those means that are 'equivalent' to the actual means shown in the patent specification." Warner-Jenkinson, 117 S. Ct. at 1048. Section 112, P 6 restricts the scope of a functional claim limitation as part of a literal infringement analysis. See Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 934, 4 U.S.P.Q.2D (BNA) 1737, 1739 (Fed. Cir. 1987). Thus, an equivalent under § 112, P 6 informs the claim meaning for a literal infringement analysis. The doctrine of equivalents, on the other hand, extends enforcement of claim terms beyond their literal reach in the event "there is 'equivalence' between the elements of the accused product or process and the claimed elements

of the patented invention." Warner-Jenkinson, 117 S. Ct. at 1045.

[HN8]One important difference between § 112, P 6 and the doctrine of equivalents involves the timing of the separate analyses for an "insubstantial change." As this court has recently clarified, a structural equivalent under § 112 must have been available at the time of the issuance of the claim. See Chiuminatta, 145 F.3d at 1310. An equivalent structure or act under § 112 cannot embrace technology developed [**22] after the issuance of the patent because the literal meaning of a claim is fixed upon its issuance. An "after arising equivalent" infringes, if at all, under the doctrine of equivalents. See Warner-Jenkinson, 117 S. Ct. at 1052; Hughes Aircraft Co. v. U.S., 140 F.3d 1470, 1475, 46 U.S.P.Q.2D (BNA) 1285, 1289 (Fed. Cir. 1998). Thus, the temporal difference between patent issuance and infringement distinguish an equivalent under § 112 from an equivalent under the doctrine of equivalents. See Chiuminatta, 145 F.3d at 1310. In other words, [HN9]an equivalent structure or act under § 112 for literal infringement must have been available at the time of patent issuance while an equivalent under the doctrine of equivalents may arise after patent issuance and before the time of infringement. See Warner-Jenkinson, 117 S. Ct. at 1053. An "after-arising" technology could thus infringe under the doctrine of equivalents without infringing literally as a § 112, P 6 equivalent. n2 Furthermore, under § 112, P 6, the accused device must perform the identical function as recited in the claim element [**1321] while the doctrine of equivalents may be satisfied when the function performed by the accused device [**23] is only substantially the same. See Cybor, 138 F.3d at 1456; Hughes Aircraft, 140 F.3d at 1475.

----- Footnotes -----

n2 These principles, as explained in Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc., 145 F.3d 1303, 46 U.S.P.Q.2D (BNA) 1752 (Fed. Cir. 1998), suggest that title 35 will not produce an "equivalent of an equivalent" by applying both § 112, P 6 and the doctrine of equivalents to the structure of a given claim element. A proposed equivalent must have arisen at a definite period in time, i.e., either before or after patent issuance. If before, a § 112, P 6 structural equivalents analysis applies and any analysis for equivalent structure under the doctrine of equivalents collapses into the § 112, P 6 analysis. If after, a non-textual infringement analysis proceeds under the

doctrine of equivalents. Patent policy supports application of the doctrine of equivalents to a claim element expressed in means-plus-function form in the case of "after-arising" technology because a patent draftsman has no way to anticipate and account for later developed substitutes for a claim element. Therefore, the doctrine of equivalents appropriately allows marginally broader coverage than § 112, P 6.

----- End Footnotes -----

[**24] [HN10]

Although § 112, P 6 and the doctrine of equivalents are different in purpose and administration, "a finding of a lack of literal infringement for lack of equivalent structure under a means-plus-function limitation may preclude a finding of equivalence under the doctrine of equivalents." Chiuminatta, 145 F.3d at 1311. Both equivalence analyses, after all, apply "similar analyses of insubstantiality of the differences." Id. This confluence occurs because infringement requires, either literally or under the doctrine of equivalents, that the accused product or process incorporate each limitation of the claimed invention. See Warner-Jenkinson, 117 S. Ct. at 1049; Pennwalt, 833 F.2d at 935. Therefore, if an accused product or process performs the identical function and yet avoids literal infringement for lack of a § 112, P 6 structural equivalent, it may well fail to infringe the same functional element under the doctrine of equivalents. See Chiuminatta, 145 F.3d at 1311. This same reasoning may be applied in reverse in certain circumstances. Where, as here, there is identity of function and no after-arising technology, a means-plus-function claim element that is found [**25] to be infringed only under the doctrine of equivalents due to a jury instruction failing to instruct on § 112, P 6 structural equivalents is also literally present in the accused device.

VSI's Version 2 hanger tag has a central body and two arms, with one arm extending from each side of the body. Each arm has a hole near the end for receipt of an eyeglasses temple. The body also has an aperture through which a cantilever rod can be placed so the hanger tag can be hung from a display rack. VSI's Version 2 hanger tag is the subject of U.S. Patent No. 5,141,104 (the '104 patent). Figure 4 of the '104 patent illustrates these features.

[SEE FIGURE 4 IN ORIGINAL]

As noted above, the doctrine of equivalents and structural equivalents under § 112, P 6, though different in purpose and administration, can at times render the same result. In this case, the jury found infringement under the doctrine of equivalents. This finding presupposes that the jury found an equivalent for each element of the claimed invention, including the "means for securing." The holes in the arms of VSI's Version 2 hanger tag secure a portion of the eyeglasses frame (the temples) to the hanger member and therefore [**26] perform the identical function of the claim element in question. The jury was instructed that the "means for securing" disclosed in the '345 patent "is a mechanically fastened loop that . . . can be formed from a separate extension or integral extension and includes either the rivet fastener or the button and hole fastener." Based on this instruction, the jury found [*1322] that the holes in the arms of the Version 2 hanger tag were equivalent to the mechanically fastened loop of the '345 patent under the doctrine of equivalents.

The parties do not dispute that the holes in the arms of the accused device perform a function identical to the extension of the patented device. Furthermore, the holes do not constitute an after-arising technology. Because the functions are identical and the holes are not an after-arising technology, the jury's finding of infringement under the doctrine of equivalents indicates that the jury found insubstantial structural differences between the holes in the arms of the Version 2 hanger tag and the loop of the '345 patent claim element. That finding is also sufficient to support the inference that the jury considered these to be structural equivalents under § 112, [**27] P 6. For these reasons, any perceived error in the district court's jury instruction regarding the "means for securing" is, at most, harmless.

Magnivision also argues that the district court improperly construed the "opening means" of claim 1 of the '345 patent. The court instructed the jury that "the 'opening means' is the elongated slot having a notch as described and depicted in the '345 patent, and the structural equivalents thereof." Citing Al-Site Corp. v. Bonneau Co., 22 F.3d 1107, 33 U.S.P.Q.2D (BNA) 1136, 1139 (Fed. Cir. 1994), Magnivision argues that this court has already construed this structure to be "an enclosed hole and equivalents thereof."

For several reasons, Magnivision's reliance on Bonneau fails. First, as Magnivision admits, in Bonneau, this court construed claim 8 of the '532 patent, not the claims of the '345 patent. These claims have different language and different meanings. Furthermore, Magnivision did not inform the trial court that Bonneau was a non-precedential opinion (in

which Magnivision lost), which may only be cited for its issue preclusive effect against Magnivision. Finally, in Bonneau, Magnivision argued for a broader claim construction [**28] than that eventually adopted by this court. This litigation record gives no reason to think that the court rejected the district court's construction in this case, nor any reason to deny VSI the opportunity to seek a narrower construction. With regard to claim 1 of the '345 patent, the claim element "opening means for receiving cantilever support means and securing a horizontal orientation for the eyeglasses" invokes § 112, P 6, and the district court correctly determined the scope of the claim.

In a further attempt to overturn the jury verdict of infringement under the doctrine of equivalents with respect to the '345, '726, and '911 patents, VSI relies on prosecution history estoppel. This court has reviewed VSI's prosecution history estoppel argument and finds it unpersuasive. To overcome prior art objections by the Examiner, Magnivision amended what became claim 8 of the '532 patent to require that the extension project from the bottom edge portion of the hanger tag. Citing Mark 1 Marketing Corp. v. R.R. Donnelley & Sons Co., 66 F.3d 285, 291, 36 U.S.P.Q.2D (BNA) 1095, 1100 (Fed. Cir. 1995), VSI argues that because all of Magnivision's patents arose from related applications, the same [**29] prosecution history estoppel applies to them as well. VSI therefore contends that because the arms of its Version 2 hanger tag extend from the sides of the body of the tag, it cannot infringe the claims of these patents under the doctrine of equivalents as restricted by prosecution history estoppel. While in some cases, the prosecution history of a related application may limit application of the doctrine of equivalents in a later filed patent, in this case the specific limitation added in the claims of an earlier issued patent is not present in the claims of the later issued patents. The '345, '726, and '911 patents all have limitations not found in the '532 patent and did not necessarily require the specific limitation added to the claims of the '532 patent to be patentable. The specific limitations added to gain allowance of the '532 patent are not included in and [**30] are therefore not relevant to determining the scope of the claims of the later issued patents.

In sum, the district court erred by interpreting several of the claim elements in the '345, '726 and '911 patents as means-plus-function elements subject to § 112, P 6. Because, properly construed, these claims do not call [**31] for interpretation under § 112, P 6, the district court's reading unnecessarily limited their scope. This court has cautioned against incorporating unwarranted functional or structural limitations from the specification into the claims. See Transmatic, Inc. v. Gulton Indus., Inc., 53 F.3d 1270, 1277, 35

U.S.P.Q.2D (BNA) 1035, 1041 (Fed. Cir. 1995)

Despite the district court's unwarranted restriction of the claims, the jury found infringement under the doctrine of equivalents. Although a reasonable dispute as to the application of the correctly interpreted claims to the accused structure prevents a determination of literal infringement as a matter of law, because the jury found infringement under the trial court's more restricted reading of the claims, this court need not remand for an infringement determination according to this court's broader claim interpretation. Proceeding claim element by claim element, the jury has already found infringement. This court's correction of the claim scope does not disturb that determination.

Validity of the '532, '345, '726, and '911 patents

VSI challenges the validity of all four Magnivision patents under 35 U.S.C. § 103. Specifically, VSI asserts [**31] that these patents are obvious in light of U.S. Patent No. 3,738,034 (the Seaver patent) or the 1984 B&G catalog and the knowledge of one of ordinary skill in the art. VSI also asserts obviousness based on the Rosen patent (U.S. Patent No. 3,291,300), the Pacelli patent (U.S. Patent No. 3,116,529), and German Design Patent No. G 8,212,306.3 U1 (the German patent). On appeal, VSI particularly urges that the Cool-Ray catalogs (which depict the commercial embodiment of the Seaver patent), when viewed with the knowledge of one of ordinary skill in the art, render all of the disputed claims invalid for obviousness. The jury considered and rejected VSI's claims of invalidity.

Although the determination of obviousness is ultimately a legal conclusion, it rests on underlying factual determinations. See Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 U.S.P.Q. (BNA) 459, 467, 15 L. Ed. 2d 545, 86 S. Ct. 684 (1966). [HN11]Issued patents have a strong presumption of validity in infringement proceedings. See 35 U.S.C. § 282 (1994). Hence, an accused infringer who defends on grounds of patent invalidity bears the burden of showing patent invalidity by clear and convincing evidence. See Monarch Knitting [**32] Mach. v. Sulzer Morat GMBH, 139 F.3d 877, 881, 43 U.S.P.Q.2D (BNA) 1977, 1981 (Fed. Cir. 1998).

[HN12]In a challenge based on obviousness under 35 U.S.C. § 103, the person alleging invalidity must show prior art references which alone or combined with other references would have rendered the invention obvious to one of ordinary skill in the art at the time of invention. See Dennison Mfg. Co. v. Panduit Corp., 475 U.S. 809, 810, 229 U.S.P.Q. (BNA) 478, 479, 89 L. Ed. 2d 817, 106 S. Ct. 1578 (1986); Rockwell Int'l Corp. v. United States, 147 F.3d 1358, 1364, 47 U.S.P.Q.2D (BNA) 1027, 1032 (Fed. Cir. 1998). The

"presumption of validity under 35 U.S.C. § 282 carries with it a presumption that the Examiner did his duty and knew what claims he was allowing." Intervet Am., Inc. v. Kee-Vet Labs., Inc., 887 F.2d 1050, 1054, 12 U.S.P.Q.2D (BNA) 1474, 1477 (Fed. Cir. 1989). Therefore, the challenger's "burden is especially difficult when the prior art was before the PTO examiner during prosecution of the application." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1467, 15 U.S.P.Q.2D (BNA) 1525, 1527 (Fed. Cir. 1990).

[HN13] The party seeking patent invalidity based on obviousness must also show some motivation or suggestion [**33] to combine [**1324] the prior art teachings. See In re Rouffet, 149 F.3d 1350, 1355, 47 U.S.P.Q.2D (BNA) 1453, 1457 (Fed. Cir. 1998); Motorola, 121 F.3d at 1472. A suggestion or motivation to combine generally arises in the references themselves, but may also be inferred from the nature of the problem or occasionally from the knowledge of those of ordinary skill in the art. See Rouffet, 149 F.3d at 1355.

In this case, the United States Patent and Trademark Office (the PTO) considered nearly all the prior art that VSI asserts renders Magnivision's patents obvious. The PTO considered the Seaver patent during its prosecution of the applications for each of the '345, '726, and '911 patents. The B&G catalog was before the PTO in the application that led to the '911 patent. Moreover, the structure of the B&G reference appears in the Smilow Patent (U.S. Patent No. 3,710,996) which was cited against each of these patents. All of the other references, except the Rosen patent, which is similar to the German patent, were before the PTO in the examinations of one or more of the Magnivision patent applications.

The Seaver patent is the most pertinent prior art. The Seaver patent discloses a security [**34] tag for eyeglasses. The Seaver tag is used as an anti-theft device in conjunction with prior art displays. In these displays, the temples of the eyeglasses are not folded, but rather extend through openings in the display. The Seaver security tag is not a hanger display tag and is not designed nor intended to have a cantilevered support extend through it. Neither does the Seaver patent suggest stacking a plurality of folded eyeglasses on a cantilevered support. The Seaver security tag does, however, disclose some elements of the claimed invention, such as a loop that secures the tag to the eyeglasses. Nevertheless, although the Seaver patent discloses some of the elements recited in the Magnivision patents' claims, it does not disclose the display member, the cantilevered support, or the

aperture for mounting the hanger tag on the cantilevered support.

VSI argues that it would have been obvious to one of ordinary skill in the art to punch a hole in the Seaver security tag and hang it from a cantilevered support. VSI points to the problems in the art and the Rosen, German, and Pacelli patents to support this conclusion. VSI is unable, however, to point to any specific teaching or suggestion [**35] for making this combination. VSI instead relies on what it presumes is the level of knowledge of one of ordinary skill in the art at the time of the invention to supply the missing suggestion to combine. In the first place, [HN14] the level of skill in the art is a prism or lens through which a judge or jury views the prior art and the claimed invention. This reference point prevents these deciders from using their own insight or, worse yet, hindsight, to gauge obviousness. Rarely, however, will the skill in the art component operate to supply missing knowledge or prior art to reach an obviousness judgment. See W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 U.S.P.Q. (BNA) 303, 312-13 (Fed.Cir.1983) ("To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher."). Skill in the art does not act as a bridge over gaps in substantive presentation of an obviousness case, but instead supplies the primary guarantee of objectivity in the process. [**36] See Ryko Mfg. Co. v. Nu-Star, Inc., 950 F.2d 714, 718, 21 U.S.P.Q.2D (BNA) 1053, 1057 (Fed.Cir.1991).

[HN15] The level of skill in the art is a factual determination. See Graham, 383 U.S. at 17-18. Because the jury considered and rejected VSI's challenge on this grounds, it evidently concluded that one of ordinary skill in the art would not have known to make this combination. This factual finding is supported by substantial evidence. [**1325] VSI's argument in this regard is therefore an impermissible effort at hindsight recreation. See Grain Processing Corp. v. American Maize-Products Co., 840 F.2d 902, 5 U.S.P.Q.2D (BNA) 1788, 1792 (Fed. Cir. 1988).

The German patent (and the similar Rosen patent) disclose theft-resistant display tags for sunglasses. These display tags are essentially plastic cards with holes for receiving the temples of the sunglasses and another hole for hanging them on a cantilevered support. In some ways, they are similar to the Magnivision patents. In other ways, however, they are quite different. Dr. Chrycy, an expert optometrist, explained that the device disclosed in the German

patent would not be suitable as a display tag for reading eyeglasses because it does not allow a person [**37] trying them on to determine if they are the correct strength. The plastic card of the German display tag interferes with the proper fit of the eyeglasses and therefore would result in visual distortions or blurring. The Rosen patent has similar drawbacks.

The Pacelli patent also discloses a theft-resistant tag for displaying sunglasses. To secure the glasses, the Pacelli patent uses a sheet of plastic which covers the frame and impairs the view of a person trying on the glasses. Dr. Chrycy testified that this would result in alteration of the view through the lenses and would therefore not serve as a reading glasses display tag.

The B&G catalog primarily discloses belt hangers. Although the catalog discloses possible use of these hangers for eyeglasses, Mr. Hallerman, another expert, testified that they could not be used effectively for holding eyeglasses because they lacked the necessary stability.

Magnivision further supports the jury's factual findings related to nonobviousness with record evidence of secondary considerations. These secondary considerations, such "as commercial success, long felt but unresolved needs, failure of others, etc., also provide objective proof of [**38] nonobviousness. Dennison, 475 U.S. at 810. The record shows the commercial success of the claimed invention, including demonstration of a nexus between the commercial success and the patented invention, and evidence of a long felt need for a solution to several of the problems addressed by the invention.

Mort Nyman, an expert in the design, development and marketing of non-prescription reading glasses, testified regarding the problems experienced with prior art eyeglass hangers. He further testified that efforts prior to Magnivision's invention were unsuccessful in solving these problems. Prior art displays were bulky and incapable of displaying several pairs of eyeglasses at the same vertical position. Prior art displays contained openings for insertion of the temples of the eyeglasses and therefore allowed only one pair of eyeglasses per vertical position. Because fewer glasses fit on the prior art displays, vendors had to frequently refill the display rack. Moreover, prior art theft-resistant displays prevented potential customers from effectively trying on the eyeglasses.

Magnivision overcame the deficiencies of the prior art by developing a hanger tag which does not interfere [**39] with the opening and closing of the temples or distort the view of the user through the eyeglasses. Furthermore, Magnivision's hanger tags featured an

aperture for mounting on a cantilevered support. In this way, several pairs of eyeglasses of the same magnification strength could fit on the display together. Due to this design, store managers no longer needed to frequently refill the eyeglass display rack. For these reasons, the theft-resistant hanger tags disclosed in the Magnivision patents satisfied the long-felt needs of the industry.

Magnivision also presented evidence of commercial success, which further tended to establish the nonobviousness of the claimed inventions. Particularly, Magnivision presented evidence showing that all of the retail chains that sold Magnivision glasses wanted to switch from the prior art displays to Magnivision's patented displays. Magnivision also presented evidence [**1326] showing that as a direct result of Magnivision's patented inventions, the number of locations selling Magnivision eyeglasses more than doubled. This evidence of commercial success further strengthened the district court's determination that the Magnivision patents were not obvious. [**40] The factual findings made by the jury underlying this determination are supported by substantial evidence.

Based on the evidence presented at trial, the jury found that VSI failed to provide clear and convincing evidence of obviousness. Because the finding of obviousness rests on underlying factual determinations, which the jury found adverse to VSI, the district court correctly concluded that the Magnivision patents are not invalid under 35 U.S.C. § 103.

Trade Dress Infringement

[HN16] For areas of law, such as trademark and trade dress infringement, which are not unique to this court's jurisdiction, this court applies the law of the pertinent regional circuit, in this case the United States Court of Appeals for the Eleventh Circuit. See Pro-Mold and Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1574, 37 U.S.P.Q.2D (BNA) 1626, 1631 (Fed. Cir. 1996). [HN17] Under Eleventh Circuit law, a finding of trademark and trade dress infringement is a question of fact. See Amrit, Inc. v. Kraft, Inc., 812 F.2d 1531, 1535 (11th Cir. 1986). A jury verdict of trademark or trade dress infringement is therefore reviewed for substantial evidence. See John H. Harland Co. v. Clarke Checks, Inc., 711 F.2d 966, 973, 219 U.S.P.Q. (BNA) 515, 522 (11th Cir. 1983). Legal determinations of the district court, however, receive no deference on review. See Lucero v. Trosch, 121 F.3d 591, 599 (11th Cir. 1997).

[HN18] Trade dress protection embraces the total image of the product including such factors as the size, shape, and color of the product's packaging and

appearance. See Two Pesos, Inc. v. Taco Cabana, Inc., 505 U.S. 763, 765 n.1, 23 U.S.P.Q.2D (BNA) 1081, 1082 n.1, 120 L. Ed. 2d 615, 112 S. Ct. 2753 (1992). To prove trade dress infringement, the plaintiff must show: (1) the inherent distinctiveness or secondary meaning of its trade dress, (2) the essential nonfunctionality of its trade dress, and (3) the likelihood of consumer confusion as to origin, sponsorship, or approval due to similarity between its and the defendant's trade dress. See University of Fla. v. KPB, Inc., 89 F.3d 773, 776-77, 39 U.S.P.Q.2D (BNA) 1603, 1605 (11th Cir. 1996). Because this is a conjunctive test, failure to prove even one of these elements precludes a showing of trade dress infringement. Therefore, the defendant can secure a summary judgment of noninfringement by demonstrating that the plaintiff cannot show any element [**42] of the cause of action.

As mentioned above, protection hinges on the distinctiveness or secondary meaning of the trade dress. [HN19] Distinctive trade dress enables consumers to distinguish a product from others and identify that product with its source. See id. at 776 n.5. The Eleventh Circuit gauges distinctiveness based on whether trade dress "[is] a 'common' basic shape or design, whether it [is] unique or unusual in a particular field, [and] whether it [is] a mere refinement of a commonly adopted and well-known form of ornamentation for a particular class of goods viewed by the public as a dress or ornamentation for the goods." Id. (quoting Ambril, 812 F.2d at 1536). Trade dress can also satisfy this requirement by showing secondary meaning, or a "connection in the consumer's mind between the mark and the product's producer, whether that producer is known or unknown." Id. [HN20] The plaintiff may show secondary meaning in several ways. The plaintiff may show secondary meaning with consumer surveys and with evidence of lengthy and uniform display of the dress. See Conagra, Inc. v. Singleton, 743 F.2d 1508, 1513, 224 U.S.P.Q. (BNA) 552, 555-56 (11th Cir. 1984). The plaintiff [**43] may also show secondary meaning with evidence of the plaintiff's efforts - usually through advertising - [*1327] to establish in the minds of the consumers a connection between the trade dress and its product. See id. Finally, the plaintiff may use other evidence showing consumers' association of the trade dress with the plaintiff or its product to prove secondary meaning. See id.

[HN21] Trade dress must also be primarily nonfunctional. A trade dress is functional "if it is essential to the use or purpose of the article or if it affects the cost or quality of the article," Inwood Labs., Inc. v. Ives Labs., Inc., 456 U.S. 844, 850 n.10, 214 U.S.P.Q. (BNA) 1, 4 n.10, 72 L. Ed. 2d 606, 102 S. Ct.

2182 (1982), such that its protection would place a competitor at a significant disadvantage, see Qualitex Co. v. Jacobson Prods. Co., 514 U.S. 159, 165, 34 U.S.P.Q.2D (BNA) 1161, 1165, 131 L. Ed. 2d 248, 115 S. Ct. 1300 (1995).

[HN22] Trade dress protection also requires evidence of a likelihood of confusion between the plaintiff's and the defendant's trade dress. Determining whether a likelihood of confusion exists requires weighing several factors: (1) the nature of the plaintiff's mark, (2) the similarity of the [**44] marks, (3) the similarity of the products the marks represent, (4) the similarity of the parties' retail outlets and customers, (5) the similarity of the parties' advertising, (6) the defendant's intent to copy or imitate the plaintiff's mark, and (7) the extent of actual confusion. See Wesco Mfg., Inc. v. Tropical Attractions of Palm Beach, Inc., 833 F.2d 1484, 1488, 5 U.S.P.Q.2D (BNA) 1190, 1193-94 (11th Cir. 1987).

The jury found that VSI infringed Magnivision's display card and blister pack trade dress, Magnivision's color coding trade dress, and Magnivision's eyeglass styles and colors trade dress. Each of these trade dresses requires separate analysis.

Display Card/ Blister Pack Trade Dress

Magnivision used a particular display card and blister pack to market its hand-held magnifiers. The display card contains a bold red stripe along its right-hand side and a gray and white cross-hatched background over the remainder of the card. As evidence of distinctiveness of this trade dress, Magnivision presented testimony by Morton Nyman, its president, "that Magnivision is the only company that used this design until it was copied by VSI." Magnivision's use of a display design different [**45] from others, however, does not suffice to show distinctiveness in the minds of consumers. Rather, sole use of a design is a preliminary step for a descriptive trade dress to acquire distinctiveness and secondary meaning. See In re Owens-Corning Fiberglas Corp., 774 F.2d 1116, 1125, 227 U.S.P.Q. (BNA) 417, 422 (Fed. Cir. 1985) ("An evidentiary showing of secondary meaning . . . includes evidence of the trademark owner's method of using the mark, supplemented by evidence of the effectiveness of such use to cause the purchasing public to identify the mark with the source of the product.").

In this case, Magnivision did not supply evidence of distinctiveness or secondary meaning. Although Magnivision presented some testimony of sole use, the facts belie any acquisition of secondary meaning. A review of some factors related to secondary meaning show the inadequacy of Magnivision's showing. For

instance, with regard to the length and manner of the trade dress use, the record shows that Magnivision used its display design for only two years. Moreover, Magnivision disc ntinued use of the design two years before VSI put their allegedly infringing packaging on the market. With respect to the nature [**46] and extent of advertising and promotion - the efforts by the plaintiff to promote a conscious connection in the public's mind between the trade dress and the plaintiff's business - the record shows that Magnivision made significant promotional expenditures. None of these expenditures or activities, however, was tied to the display card trade dress. The record also contained no evidence that consumers actually recognized Magnivision's allegedly distinctive trade dress for hand-held magnifiers.

[*1328] Without evidence of distinctiveness or secondary meaning beyond its assertion of sole use, no reasonable juror could have found that Magnivision's design had acquired secondary meaning. Hence, Magnivision did not supply enough evidence of this first requirement for trade dress infringement to support the jury's verdict. This conclusion alone precludes a finding of trade dress infringement on the display card. Nonetheless, a brief review of the evidence of likelihood of confusion underscores this court's determination.

As mentioned earlier, the likelihood of confusion analysis requires consideration of several factors. In this case, although the consumers and markets were similar, the packaging [**47] was not. Comparison of the two packages shows distinct differences in appearance. Specifically, both the graphics and color scheme are different. VSI's accused packaging does not contain either the bold red stripe or the cross-hatched gray and white background of Magnivision's asserted trade dress. VSI's display card contains a dark black band across the top, with gray and blue stripes covering the remainder of the card. Additionally, VSI's ACURAVISION trademark is prominently displayed in the top black band. Furthermore, VSI's accused display card contains other distinctive features such as a broad blue arrow and MAGNA . DOT trademark under the lens of the magnifier.

Perhaps because of the substantial differences between the accused packaging and Magnivision's asserted trade dress, Magnivision did not produce any evidence of actual customer confusion. The record as a whole lacks evidence to support the jury's finding of a likelihood of consumer confusion.

No reasonable juror could have found trade dress infringement of the display cards. Because the district court based its injunction prohibiting similar display cards on other accessories on the jury's finding of

display card infringement, [**48] the district court abused its discretion in enjoining the use of the accessory packages.

Color Coding Trade Dress

The jury also found that VSI had infringed Magnivision's trade dress in its color coding system. This alleged trade dress is an array of horizontal color-coded stripes on Magnivision's eyeglass hanger tags which identify the power of the glasses. Under this system, the hangers for eyeglasses of a particular power would feature a particular color. Eyeglasses of a different power would hang from a tag with a different color.

At the outset, the record does not contain sufficient evidence to show any distinctiveness or secondary meaning for Magnivision's color coding system. Color itself is not inherently distinctive. See Qualitex, 514 U.S. at 163 ("Over time, customers may come to treat a particular color on a product or its packaging (say, a color that in context seems unusual, such as pink on a firm's insulating material or red on the head of a large industrial bolt) as signifying a brand."). Thus, to support its finding of infringement, the jury must have found secondary meaning in this color-coding system. The record, however, discloses no evidence to support such [**49] a finding.

Other companies used color coding to market non-prescription reading glasses for many years. Thus, Magnivision has a significant burden to show that its particular color-coding system had acquired source-identifying significance in the minds of the consuming public. Magnivision's burden becomes almost insurmountable in light of the evidence showing that its coloring system changed from time to time. "[HN23]Absent a specifically defined, color-definite, and stable visual appearance, an alleged trade dress cannot receive protection." Keystone Camera Prods. Corp. v. Ansco Photo-Optical Prods. Corp., 667 F. Supp. 1221, 1229, 3 U.S.P.Q.2D (BNA) 1797, 1802 (N.D. Ill. 1987) (emphasis added).

Although the actual colors Magnivision associated with particular diopter strengths did not change significantly, [*1329] Magnivision changed its coding method several times. At various times Magnivision used three different ways to signify diopter strength: the color of the diopter numbers, a horizontal stripe of color across one side of the tag, or a colored rectangle. Without a stable visual appearance and absent any other evidence of consumer identification of the Magnivision's color-coding system, no [**50] reasonable juror could conclude that the stripe of color now asserted as a trade dress has acquired secondary meaning.

Furtherm re, even if Magnivision could show secondary meaning in its color coding system, [HN24]color coding cannot act as an indicator of source because it is primarily functional. See Two Pesos, 505 U.S. at 775 (trade dress is functional if it "is one of a limited number of equally efficient options available to competitors and free competition would be hindered by according the design trademark protection"); Spraying Sys. Co. v. Delavan, Inc., 762 F. Supp. 772, 781, 19 U.S.P.Q.2D (BNA) 1121, 1128 (N.D. Ill. 1991), aff'd, 975 F.2d 387, 24 U.S.P.Q.2D (BNA) 1181 (7th Cir. 1992) ("color coding as an identification system is clearly functional"). In this case, the record shows that Magnivision used color coding to indicate diopter strength, not to indicate source. Magnivision itself stated that color coding allows the racks to be serviced more easily, aids consumers in selecting the correct diopter, and reduces the time and cost of restocking the glasses. Additionally, as noted earlier, color coding serves these same cost-saving functions for many competitors in the non-prescription [**51] eyeglass industry. To give one competitor an exclusive right to practice color-coding would give it a significant advantage over other companies.

Because color coding is primarily functional, the record refutes the jury's verdict of trade dress infringement of Magnivision's color coding system. On the basis of this record, this court concludes that no reasonable juror could have found trade dress infringement of Magnivision's color coding scheme because of the functional nature of the trade dress and the lack of showing of secondary meaning. This court, therefore, need not proceed to examine the likelihood of confusion. Because the jury verdict of trade dress infringement lacks substantial evidence, the district court abused its discretion by enjoining VSI's use of its hanger tag labels based on trade dress infringement.

Eyeglass Styles and Colors Trade Dress

The jury also found that VSI infringed the trade dress of six of Magnivision's eyeglass styles. Once again, however, the record contains insufficient evidence that Magnivision's colors or styles were inherently distinctive or possessed secondary meaning. Mr. Nyman testified that Magnivision purchased its allegedly distinctive [**52] styles from publicly available molds. VSI purchased its accused styles from publicly available stock as well. This evidence of the public availability of Magnivision's product raises significant hurdles to a finding that its styles are inherently distinctive as an indicator of source. See Mano Prods., Inc. v. Columbia Cosmetics Mfg., Inc., 65 F.3d 1063, 1070, 36 U.S.P.Q.2D (BNA) 1176, 1180 (2nd Cir. 1995) ([HN25]When similar packaging can

be purchased by other companies and is publicly available, "it defies simple logic to suggest that the packaging was inherently distinctive.").

Magnivision produced no evidence of secondary meaning. The record demonstrates that it changed its styles to suit demand. Constantly changing styles rarely demonstrate the stability necessary for the public to identify those particular characteristics with a particular source. See, e.g., Keystone, 667 F. Supp. at 1226 (identifying the significant weakness in the plaintiff's trade dress claim as being that the Le Clic "look" was "nothing more than a reflection of the fashion trends taking place generally in the marketplace of youthful consumers."). Thus, the record shows that the publicly available, constantly [**53] changing styles of Magnivision's eyeglasses lacked secondary meaning.

[**1330] Without inherent distinctiveness or secondary meaning, Magnivision's eyeglass styles and colors lacked a protectable trade dress. Absent a protectable trade dress, no reasonable juror could find trade dress infringement.

Trademark Infringement of the MAGNIVISION mark

The jury found that VSI's mark MAGNA DOT infringes Magnivision's MAGNIVISION mark. [HN26]To prove trademark infringement, a trademark owner must show a likelihood that consumers would confuse the defendant's mark with the protected mark. See Dieter v. B&H Indus. of Southwest Fla., Inc., 880 F.2d 322, 326, 11 U.S.P.Q.2D (BNA) 1721, 1723 (11th Cir. 1989). The Eleventh Circuit identifies several factors which contribute to a likelihood of confusion finding: (1) the nature of the plaintiff's mark, (2) the similarity of the marks, (3) the similarity of the products represented by the marks, (4) the similarity of the retail outlets and consumers, (5) the nature and extent of the parties' advertising, (6) the defendant's intent to copy the plaintiff's mark, and (7) the extent of actual confusion. See Wesco, 833 F.2d at 1488; Coach House Restaurant, Inc. v. Coach [**54] and Six Restaurants Inc., 934 F.2d 1551, 1561, 19 U.S.P.Q.2D (BNA) 1401, 1409 (11th Cir. 1991). Other relevant factors include the strength of the marks, the number and nature of similar marks in use on similar goods, the nature and extent of any actual confusion and the length of time during and conditions under which there has been concurrent use without evidence of actual confusion. See In re E.I. DuPont DeNemours & Co., 476 F.2d 1357, 1361, 177 U.S.P.Q. (BNA) 563, 567 (CCPA 1973).

[HN27]Similarity of the marks is a hallmark of consumer confusion. See E. Remy Martin & Co., S.A. v. Shaw-Ross Int'l Imports, Inc., 756 F.2d 1525, 1531,

225 U.S.P.Q. (BNA) 1131, 1135 (11th Cir. 1985) ("In evaluating the similarity of marks, we must consider . . . the appearance, sound and meaning of the marks, as well as the manner in which they are displayed."). In this instance, however, the marks do not present a similar sound, meaning, or commercial impression. The MAGNIVISION mark is a single word; the MAGNA . DOT mark consists of two words separated by a darkened circle. The MAGNIVISION mark has four syllables; the MAGNA . DOT mark has three. The MAGNIVISION mark displays eleven letters, the last seven of which do not appear [**55] in the MAGNA . DOT mark; the MAGNA . DOT mark has eight letters and a dot.

The only similarity between the marks is the MAGNA/MAGNI prefix. The record shows, however, that the MAGNA/MAGNI prefix as well as the VISION suffix enjoy wide use in the eyeglass industry on similar goods and services. This evidence included a number of registered trademarks for magnification lenses and eyeglasses (i.e., MAGNA ADD, MAGNA THIN, MAGNA-BAR, MAGNA-COM, MAGNA-LITE, MAGNA-PAGE, MAGNA-RULE, MAGNA-SIGHTER, MAGNATEL, MAGNI-FOCUSER, MAGNI-LENS, MAGNI-SPECS, MAGNI-STAT, MAGNI-VIEWER, COOPERSVISION, VALLEN VISION, ACURAVISION, CLEAR VISION, COOP VISION, COYOTE VISION, CRYSTAL VISION, POWER VISION, SELECT-A-VISION, TRUVISION, ULTRAVISION). The common usage of these descriptive terms weighs strongly against a finding of likelihood of confusion. See, e.g., Sun Banks of Fla., Inc., v. Sun Fed. Sav. & Loan Ass'n, 651 F.2d 311, 316, 211 U.S.P.Q. (BNA) 844, 849 (5th Cir. 1981) ("We find the extensive third-party use of the word 'Sun' impressive evidence that there would be no likelihood of confusion between Sun Banks and Sun Federal.").

The record shows that these trademarks appeared side-by-side on similar [**56] products and in similar retail outlets over a period of several years. Magnivision's own documents allege that MAGNIVISION "has become the generic term for [over-the-counter] reading glasses." Also, Magnivision made extensive advertising expenditures to promote the recognition of its mark. Nonetheless, the record contains [*1331] no showing of actual confusion between the two marks.

The differences in the marks, the absence of actual confusion despite several years of simultaneous use in an identical market, the absence of evidence that VSI intended to copy Magnivision's mark, and the weakness of the descriptive MAGNIVISION mark add up to a finding of noninfringement as a matter of law. Accordingly, this court holds that no reasonable juror

could have found infringement of the MAGNIVISION trademark by the MAGNA . DOT mark.

Unfair Competition

Because the only evidence of unfair competition in this case was Magnivision's claims of trademark and trade dress infringement, the jury's finding of unfair competition lacks substantial evidence. Unfair competition provides an additional degree of protection above that provided by trademark and trade dress law. See Freedom Sav. & Loan Ass'n v. [**57] Way, 757 F.2d 1176, 1186, 226 U.S.P.Q. (BNA) 123, 130 (11th Cir. 1985). Although trademark and trade dress infringement may be the basis for a claim of unfair competition, it frequently requires the court to examine additional conduct that would not give rise to a claim of trademark infringement. See *id.*

In this case, the only evidence in support of the unfair competition claims was the trademark and trade dress infringement claims. As stated earlier, no reasonable juror could find a likelihood of confusion between the trade dress and trademarks of VSI and Magnivision. Therefore, on the evidence presented, no reasonable juror could find that VSI engaged in unfair competition with Magnivision.

Personal Liability of Myron Orlinsky

[HN28]Title 35 authorizes a finding that an officer of a corporation is personally liable for the corporation's acts of infringement. See 35 U.S.C. § 271(a) (1994); Manville Sales Corp. v. Paramount Sys., Inc., 917 F.2d 544, 552, 16 U.S.P.Q.2D (BNA) 1587, 1593 (Fed. Cir. 1990). Personal liability under § 271(a), however, requires sufficient evidence to justify piercing the corporate veil. See *id.* The corporate entity deserves respect and legal recognition unless [**58] specific, unusual circumstances justify disregarding the corporate structure. See *id.* The most common reason for disregarding the corporate structure is that the "corporation was merely the alter ego of its officers." *Id.*

The record shows that Myron Orlinsky made the sole decision to continue using the hanger tags after VSI received cease and desist letters from Magnivision. The record, however, shows no further evidence of personal activity by Mr. Orlinsky. This evidence does not establish that Mr. Orlinsky overstepped his authority as CEO of VSI. Rather the record shows that Mr. Orlinsky acted consistent with his authority as CEO. Therefore, the record only supports the conclusion that Mr. Orlinsky acted within and according to the strictures of the corporate structure. The record shows no instance of the corporation operating as Mr. Orlinsky's alter ego. Thus, the record contains no evidence to justify piercing the corporate

veil. See, e.g., id. at 553 ("Although these facts support the conclusion that the officers had knowledge of their acts, these acts were within the scope of their employment and thus were protected by the corporate veil.")

AFFIRMED-IN-PART and REVERSED-IN-PART.

Furthermore, after [**59] VSI received the cease and desist letter, Mr. Orlinsky consulted counsel before continuing to produce the Version 1 and 2 hanger tags. The record thus shows that Mr. Orlinsky acted pursuant to a good faith belief of noninfringement engendered by advice of counsel. Once again, this evidence does not justify rejecting legal recognition of the corporate structure. See id. at 553. In sum, the record does not contain sufficient evidence that Mr. Orlinsky acted outside of the scope of his employment or that he continued to manufacture the hanger [*1332] tags knowing that they infringed Magnivision's patents.

IV.

In conclusion, although the district court erred in its construction of the claims of the '345, '726 and '911 patents, these errors were harmless because of the jury's finding of infringement under the doctrine of equivalents. This court therefore affirms the district court's decision not to grant judgment as a matter of law of non-infringement. The jury's findings with respect to trademark and trade dress infringement, however, are unsupported by substantial evidence. Furthermore, because the finding of unfair competition rested solely on the findings of trademark and trade dress [**60] infringement, that finding is also unsupported by substantial evidence. The district court therefore erred in failing to grant judgment as a matter of law that VSI did not infringe Magnivision's asserted trademark and trade dress and that it did not engage in unfair competition. This court therefore reverses the decision of the district court not to grant judgment as a matter of law with respect to the absence of trademark and trade dress infringement and the absence of unfair competition. Additionally, because the jury findings of trademark and trade dress infringement and unfair competition lacked substantial evidence, the district court's entry of a permanent injunction was an abuse of discretion. The district court's entry of the permanent injunction is thus vacated to the extent it prohibited VSI from using its accused trademark, display cards and hanger tag color coding scheme. Furthermore, there is insufficient evidence to support holding Mr. Orlinsky personally liable for the damage award. The district court's conclusion to the contrary is therefore reversed.

COSTS

Each party shall bear its own costs.

IN RE DENIS ROUFFET, YANNICK TANGUY and FREDERIC BERTHAULT

97-1492

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

149 F.3d 1350; 1998 U.S. App. LEXIS 16414; 47 U.S.P.Q.2D (BNA) 1453

July 15, 1998, Decided

PRIOR HISTORY: [**1]Appealed from: Patent and Trademark Office Board of Patent Appeals and Interferences. (Serial No. 07/888,791).

DISPOSITION: REVERSED.

CASE SUMMARY

PROCEDURAL POSTURE: Appellant patent applicants sought review of an order of appellee Patent and Trademark Office Board of Patent Appeals and Interferences, which affirmed a patent examiner's rejection of the patent applicants' application on grounds that it was obvious under 35 U.S.C.S. § 103(a).

OVERVIEW: The court held that the Patent and Trademark Office Board of Patent Appeals and Interferences (Board) committed reversible error when it determined that there was "motivation" to combine the elements of two prior lines of patents in a manner that rendered the patent applicants' claimed invention obvious under 35 U.S.C.S. § 103(a). The court held that the Board's naked invocation of "skill in the art" to supply a "suggestion to combine" the previous patents lines of patents cited by the Board was clearly erroneous. The fact that the Board merely observed that the level of skill in the art was very high, and did not identify the specific principle known to one of ordinary skill in the art that would have suggested the claimed combination, led the court to infer that the Board's finding of obviousness improperly relied on hindsight.

OUTCOME: The court reversed the order of the Patent and Trademark Office Board of Patent Appeals and Interferences, which denied the patent applicants' application.

CORE TERMS: satellite, invention, beam, skill, obviousness, combine, handover, orbit, footprint, teach, motivation, examiner, station, teaching, *prima facie* case, patentability, fan, artisan, transmitted, travel, skilled, patent, high level, plurality, hindsight, alignment, surface, antenna, loop, cell

LexisNexis(TM) HEADNOTES - Core Concepts

Patent Law > Nonobviousness > Tests & Proof of Obviousness

[HN1]To reject claims in a patent application under 35 U.S.C.S. § 103, an examiner must show an unrebutted *prima facie* case of obviousness. In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent. On appeal to the Patent and Trademark Office Board of Patent Appeals and Interferences, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of non-obviousness.

Civil Procedure > Appeals > Standards of Review > Clearly Erroneous Review

Patent Law > U.S. Patent & Trademark Office Prosecution Procedures > Appeals

[HN2]While this court reviews the Patent and Trademark Office Board of Patent Appeals and Interferences' (Board) determination in light of the entire record, an applicant may specifically challenge an obviousness rejection by showing that the Board reached an incorrect conclusion of obviousness or that the Board based its obviousness determination on incorrect factual predicates. This court reviews the ultimate determination of obviousness as a question of law. The factual predicates underlying an obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art. This court reviews the Board's factual findings for clear error. A finding is clearly erroneous when, although there is evidence to support it, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed.

Patent Law > Nonobviousness > Tests & Proof of Obviousness

[HN3]The secondary considerations are also essential components of the obviousness determination. This objective evidence of non-obviousness includes copying, long felt but unsolved need, failure of others,

commercial success, unexpected results created by the claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, and skepticism of skilled artisans before the invention.

Civil Procedure > Appeals > Standards of Review > Clearly Erroneous Review

Patent Law > U.S. Patent & Trademark Office Prosecution Procedures > Appeals

[HN4] The Patent and Trademark Office Board of Patent Appeals and Interferences (Board) must consider all of the applicant's evidence. An observation by the Board that the examiner made a *prima facie* case is not improper, as long as the ultimate determination of patentability is made on the entire record. The courts review factual conclusions drawn from this evidence for clear error. Whether the evidence presented suffices to rebut the *prima facie* case is part of the ultimate conclusion of obviousness and is therefore a question of law.

Patent Law > Nonobviousness > Tests & Proof of Obviousness

[HN5] When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. Although the suggestion to combine references may flow from the nature of the problem, the suggestion more often comes from the teachings of the pertinent references, or from the ordinary knowledge of those skilled in the art that certain references are of special importance in a particular field. Therefore, when determining the patentability of a claimed invention which combines two known elements, the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.

Patent Law > Nonobviousness > Tests & Proof of Obviousness

[HN6] Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. This legal construct is akin to the "reasonable person" used as a reference in negligence determinations. The legal construct also presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan.

Patent Law > Nonobviousness > Tests & Proof of Obviousness

[HN7] To prevent the use of hindsight based on the invention to defeat patentability of the invention, the courts require the examiner to show a motivation to

combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

Patent Law > Nonobviousness > Tests & Proof of Obviousness

Patent Law > U.S. Patent & Trademark Office Prosecution Procedures > Appeals

[HN8] Where the Patent and Trademark Office Board of Patent Appeals and Interferences does not explain the specific understanding or principle within the knowledge of a skilled artisan that would motivate one with no knowledge of a patent applicant's invention to make the combination, the courts infer that the examiner selected the references with the assistance of hindsight. The courts forbid the use of hindsight in the selection of references that comprise the case of obviousness.

Patent Law > Nonobviousness > Tests & Proof of Obviousness

[HN9] The suggestion to combine requirement is a safeguard against the use of hindsight combinations to negate patentability. While the skill level is a component of the inquiry for a suggestion to combine, a lofty level of skill alone does not suffice to supply a motivation to combine. Otherwise a high level of ordinary skill in an art field would almost always preclude patentable inventions. As the courts recognize, invention itself is the process of combining prior art in a non-obvious manner. Therefore, even when the level of skill in the art is high, the Patent and Trademark Office Board of Patent Appeals and Interferences (Board) must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious.

COUNSEL: Richard C. Turner and Grant K. Rowan, Sughrue, Mion, Zinn, Macpeak & Seas, PLLC, of Washington, DC, argued for appellants.

David J. Ball, Jr., Associate Solicitor, Office of the Solicitor, Patent and Trademark Office, of Arlington, Virginia, argued for appellee. With him on the brief were Nancy J. Linck, Solicitor, Albin F. Drost, Deputy Solicitor, and Craig R. Kaufman, Associate Solicitor.

Of counsel was Scott A. Chambers, Associate Solicitor, Office of the Solicitor.

JUDGES: Before PLAGER, Circuit Judge, ARCHER, Senior Circuit Judge, and RADER, Circuit Judge.

OPINION BY: RADER

[*1352] RADER, Circuit Judge.

Denis Rouffet, Yannick Tanguy, and Frederic Bethault (collectively, Rouffet) submitted application 07/888,791 (the application) on May 27, 1992. The Board of Patent Appeals and Interferences (the Board) affirmed final rejection of the application as obvious under 35 U.S.C. § 103(a). See *Ex parte Rouffet*, No. 96-1553 (Bd. Pat. App. & Int. Apr. 16, 1997). Because the Board reversibly erred in identifying a motivation to combine the references, this [*2] court reverses.

I.

Satellites in a geosynchronous or geostationary orbit remain over the same point on the Earth's surface. Their constant position above the Earth's surface facilitates communications. These satellites project a number of beams to the Earth. Each beam transmits to its area of coverage, or footprint, on the Earth's surface. In order to provide complete coverage, adjacent footprints overlap slightly and therefore must use different frequencies to avoid interference. However, two or more non-overlapping footprints can use the same set of frequencies in order to use efficiently the limited radio spectrum. Figure 1 from the application shows the coverage of a portion of the Earth's surface provided by multiple cone shaped beams:

[*1353] [SEE FIGURE 1 IN ORIGINAL]

OPINION: Frequency reuse techniques, however, have a limited ability to compensate for congestion in geostationary orbits. To alleviate the orbit congestion problem, new telecommunications systems use a network of satellites in low Earth orbit. When viewed from a fixed point on the Earth's surface, such satellites do not remain stationary but move overhead. A satellite's motion as it transmits a plurality of cone-shaped beams [*3] creates a new problem. The satellite's movement causes a receiver on the Earth's surface to move from the footprint of one beam into a second beam transmitted by the same satellite. Eventually, the satellite's motion causes the receiver to move from the footprint of a beam transmitted by one satellite into the footprint of a beam transmitted by a second satellite. Each switch from one footprint to another creates a "handover" event analogous to that which occurs when a traditional cellular phone travels from one cell to another. Handovers are undesirable

because they can cause interruptions in signal transmission and reception.

Rouffet's application discloses technology to reduce the number of handovers between beams transmitted by the same satellite. In particular, Rouffet eliminates handovers caused solely by the satellite's motion. To accomplish this goal, Rouffet changes the shape of the beam transmitted by the satellite's antenna. Rouffet's satellites transmit fan-shaped beams. A fan beam has an elliptical footprint. Rouffet aligns the long axis of his beams parallel to the direction of the satellite's motion across the Earth's surface. By elongating the beam's footprint in the [*4] direction of satellite travel, Rouffet's invention ensures that a fixed point on the Earth's surface likely will remain within a single footprint until it is necessary to switch to another satellite. Because Rouffet's invention does not address handovers caused by the motion of the receiver across the Earth's [*1354] surface, his arrangement reduces, but does not eliminate, handovers. Figure 3 from the application shows the footprints 12 from six beams aligned in the direction of satellite motion 15:

[SEE FIGURE 3 IN ORIGINAL]

The application contains ten claims that stand or fall as a group. Claim 1 is representative: A low orbit satellite communications system for mobile terminals, wherein the communications antenna system of each satellite provides isoflux coverage made up of a plurality of fan beams that are elongate in the travel direction of the satellite.

The examiner initially rejected Rouffet's claims as unpatentable over U.S. Pat. No. 5,199,672 (King) in view of U.S. Pat. No. 4,872,015 (Rosen) and a conference report entitled "A Novel Non-Geostationary Satellite Communications System," Conference Record, International Conference on Communications, [*5] 1981 (Ruddy). On appeal to the Board, the examiner added an alternative ground for rejection, holding that the claims were obvious over U.S. Pat. No. 5,394,561 (Freeburg) in view of U.S. Pat. No. 5,170,485 (Levine).

On April 16, 1997, the Board issued its decision. Because Rouffet had specified that the claims would stand or fall as a group based on the patentability of claim 1, the Board limited its opinion to that claim. The Board unanimously determined that the examiner had properly rejected claim 1 as obvious over King in view of Rosen and Ruddy. The Board, on a split vote, also affirmed the rejection over Freeburg in view of Levine.

[*1355] II

[HN1] To reject claims in an application under section 103, an examiner must show an unrebutted *prima facie* case of obviousness. See In re Deuel, 51 F.3d 1552, 1557, 34 U.S.P.Q.2D (BNA) 1210, 1214 (Fed. Cir. 1995). In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent. See In re Oetiker, 977 F.2d 1443, 1445, 24 U.S.P.Q.2D (BNA) 1443, 1444 (Fed. Cir. 1992). On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness. See id.

[HN2] While this court reviews the Board's determination in light of the entire record, an applicant may specifically challenge an obviousness rejection by showing that the Board reached an incorrect conclusion of obviousness or that the Board based its obviousness determination on incorrect factual predicates. This court reviews the ultimate determination of obviousness as a question of law. See In re Lueders, 111 F.3d 1569, 1571, 42 U.S.P.Q.2D (BNA) 1481, 1482 (Fed. Cir. 1997). The factual predicates underlying an obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art. See Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH, 139 F.3d 877, 881, 45 U.S.P.Q.2D (BNA) 1977, 1981 (Fed. Cir. 1998). This court reviews the Board's factual findings for clear error. See In re Zurko, 142 F.3d 1447, 1449, 46 U.S.P.Q.2D (BNA) 1691, 1693 (Fed. Cir. 1998) (in banc); Leuders, 111 F.3d at 1571-72. "A finding is clearly erroneous when, although there is evidence to support [**7] it, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed." In re Graves, 69 F.3d 1147, 1151, 36 U.S.P.Q.2D (BNA) 1697, 1700 (Fed. Cir. 1995) (quoting United States v. United States Gypsum Co., 333 U.S. 364, 395, 92 L. Ed. 746, 68 S. Ct. 525 (1948)).

[HN3] The secondary considerations are also essential components of the obviousness determination. See In re Emert, 124 F.3d 1458, 1462, 44 U.S.P.Q.2D (BNA) 1149, 1153 (Fed. Cir. 1997) ("Without Emert providing rebuttal evidence, this *prima facie* case of obviousness must stand."). This objective evidence of nonobviousness includes copying, long felt but unsolved need, failure of others, see Graham v. John Deere Co., 383 U.S. 1, 17-18, 15 L. Ed. 2d 545, 86 S. Ct. 684 (1966), commercial success, see In re Huang, 100 F.3d 135, 139-40, 40 U.S.P.Q.2D (BNA) 1685, 1689-90 (Fed. Cir. 1996), unexpected results created by the claimed invention, unexpected properties of the

claimed invention, see In re Mayne, 104 F.3d 1339, 1342, 41 U.S.P.Q.2D (BNA) 1451, 1454 (Fed. Cir. 1997); In re Woodruff, 919 F.2d 1575, 1578, 16 U.S.P.Q.2D (BNA) 1934, 1936-37 (Fed. Cir. 1990), licenses showing industry respect for [**8] the invention, see Arkie Lures, Inc. v. Gene Larew Tackle, Inc., 119 F.3d 953, 957, 43 U.S.P.Q.2D (BNA) 1294, 1297 (Fed. Cir. 1997); Pentec, Inc. v. Graphic Controls Corp., 776 F.2d 309, 316, 227 U.S.P.Q. (BNA) 766, 771 (Fed. Cir. 1985), and skepticism of skilled artisans before the invention, see In re Dow Chem. Co., 837 F.2d 469, 473, 5 U.S.P.Q.2D (BNA) 1529, 1532 (Fed. Cir. 1988). [HN4] The Board must consider all of the applicant's evidence. See Oetiker, 977 F.2d at 1445 ("An observation by the Board that the examiner made a *prima facie* case is not improper, as long as the ultimate determination of patentability is made on the entire record."); In re Piasecki, 745 F.2d 1468, 1472, 223 U.S.P.Q. (BNA) 785, 788 (Fed. Cir. 1984). The court reviews factual conclusions drawn from this evidence for clear error. Whether the evidence presented suffices to rebut the *prima facie* case is part of the ultimate conclusion of obviousness and is therefore a question of law.

[HN5] When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. See In re Geiger, 815 F.2d 686, 688, 2 U.S.P.Q.2D (BNA) 1276, 1278 (Fed. Cir. 1987). Although the [**9] suggestion to combine references may flow from the nature of the problem, see Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 U.S.P.Q.2D (BNA) 1626, 1630 (Fed. Cir. 1996), the suggestion more often comes from the teachings of the pertinent references, see In re Sernaker, 702 F.2d 989, 994, 217 U.S.P.Q. (BNA) 1, 5 (Fed. Cir. 1983), or from the ordinary knowledge of those skilled in the art that certain references are of special importance [**1356] in a particular field, see Pro-Mold, 75 F.3d at 1573 (citing Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n.24, 227 U.S.P.Q. (BNA) 657, 667 n.24 (Fed. Cir. 1985)). Therefore, "when determining the patentability of a claimed invention which combines two known elements, the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination." See In re Beattie, 974 F.2d 1309, 1311-12, 24 U.S.P.Q.2D (BNA) 1040, 1042 (Fed. Cir. 1992) (quoting Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 730 F.2d 1452, 1462, 221 U.S.P.Q. (BNA) 481, 488 (Fed. Cir. 1984)).

The parties agree that the five references asserted by the examiner [**10] are in the same field of endeavor as the invention. The parties also agree that the pertinent level of skill in the art - design of satellite communications systems - is high. On appeal, Rouffet asserts that the examiner and the Board erred by improperly combining references to render the claimed invention obvious.

The Combination of King, Rosen, and Ruddy

The Board first affirmed the rejection of Rouffet's claims over a combination of King, Rosen, and Ruddy. King discloses a system for launching a plurality of satellites into low Earth orbits from a single launch vehicle. Rosen teaches a geostationary satellite that uses a plurality of fan beams with their long axes oriented in an east-west direction to communicate with mobile and fixed terminals on the Earth.

The final, and most important, reference in this combination is Ruddy. Ruddy describes a television broadcast system that uses a series of satellites to retransmit signals sent from a ground station over a wide area. Rather than using a geostationary orbit, Ruddy teaches the use of a series of satellites in Molniya orbits. A satellite in a Molniya orbit always follows the same path through the sky when viewed from a fixed [**11] point on the ground. Viewed from the Earth, the orbital path includes a narrow, elliptical apogee loop. In order to transmit to these moving satellites from a ground station, Ruddy uses a fan beam with a long axis aligned with the long axis of the orbit's apogee loop. This alignment places the entire apogee loop within the footprint of the beam and eliminates the need for the ground station's antenna to track the satellite's motion around the apogee loop. Ruddy further teaches orbit parameters and spacing of multiple satellites to ensure that a satellite is always in the loop to receive and rebroadcast signals from the Earth station.

King and Rosen together teach the use of a network of satellites in low Earth orbit. Thus, Ruddy becomes the piece of the prior art mosaic that shows, in the reading of the Board, the use of "a plurality of fan beams that are elongate in the travel direction of the satellite." Ruddy, however, is different from the claimed invention in several respects. Specifically, the application claims the projection of multiple elliptical fan-shaped footprints from the satellite to the ground. See Claim 1, *supra*, see also Application at 6, lines 9-11 ("In [**12] addition, in this system, the geometrical shape of the beams 12 is changed: instead of being circular they are now elongate ellipses."). The application's written description further teaches that the invention's fan-shaped satellite beams will minimize

handovers. See *id.* at lines 11-16 ("This considerably increases call durations between handovers.").

In contrast, Ruddy teaches that a ground station may use a single fan-shaped beam to transmit to a satellite in a unique Molniya orbit. The ground station transmits a beam into which a series of satellites in Molniya orbits will successively enter. At least two differences are evident: the application teaches projection of multiple beams from a satellite to the Earth, while Ruddy teaches projection of a single beam from the Earth to satellites. Moreover to the extent Ruddy contains a teaching about handovers, its teachings focus on use of the unique Molniya orbit to ensure that a satellite always falls within the beam transmitted by the ground station.

These differences suggest some difficulty in showing a *prima facie* case of obviousness. The Board, however, specifically found that artisans of ordinary skill in this field of [**13] art would know to shift the frame of reference from a ground station following a satellite to a satellite transmitting to the ground. According proper deference to the Board's finding [**1357] of a lofty skill level for ordinary artisans in this field, this court discerns no clear error in the Board's conclusion that these differences would not preclude a finding of obviousness. While Ruddy does not expressly teach alignment of the fan beam with the apparent direction of the satellite's motion, this court perceives no clear error in the Board's determination that Ruddy would suggest such an alignment to one of skill in this art. Therefore, the Board did not err in finding that the combination of King, Rosen, and Ruddy contains all of the elements claimed in Rouffet's application.

However, the Board reversibly erred in determining that one of skill in the art would have been motivated to combine these references in a manner that rendered the claimed invention obvious. Indeed, the Board did not identify any motivation to choose these references for combination. Ruddy does not specifically address handover minimization. To the extent that Ruddy at all addresses handovers due to satellite motion, [**14] it addresses this subject through the selection of orbital parameters. Ruddy does not teach the choice of a particular shape and alignment of the beam projected by the satellite. Thus Ruddy addresses the handover problem with an orbit selection, not a beam shape. The Board provides no reasons that one of ordinary skill in this art, seeking to minimize handovers due to satellite motion, would combine Ruddy with Rosen and King in a manner that would render the claimed invention obvious.

[HN6]Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. See 35 U.S.C. §

103(a). This legal construct is akin to the "reasonable person" used as a reference in negligence determinations. The legal construct also presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan. See In re Carlson, 983 F.2d 1032, 1038, 25 U.S.P.Q.2D (BNA) 1207, 1211 (Fed. Cir. 1993).

As this court has stated, "virtually all [inventions] are combinations of old elements." Environmental Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 698, 218 U.S.P.Q. (BNA) 865, 870 (Fed. Cir. 1983); see also **15 Richdel, Inc. v. Sunspool Corp., 714 F.2d 1573, 1579-80, 219 U.S.P.Q. (BNA) 8, 12 (Fed. Cir. 1983) ("Most, if not all, inventions are combinations and mostly of old elements."). Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." Sensonic, Inc. v. Aerasonic Corp., 81 F.3d 1566, 1570, 38 U.S.P.Q.2D (BNA) 1551, 1554 (Fed. Cir. 1996).

[HN7] To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the **16 inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

This court has identified three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. In this case, the Board relied upon none of these. Rather, just as it relied on the high level of skill in the art to overcome the differences between the claimed invention and the selected elements in the references, it relied upon the high level of skill in the art to provide the necessary motivation. The Board did not, however, explain what specific understanding or technological principle within the knowledge of one of ordinary skill in the art would have suggested the combination. Instead, the Board merely invoked the high level of skill in the field of art. If such a rote invocation could

suffice to supply a motivation to combine, the more sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. Instead, in complex scientific fields, the Board could routinely identify **17 the prior art elements in an application, invoke the lofty level of skill, and rest its case for rejection. To counter this potential weakness in the obviousness **1358 construct, the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.

[HN8] Because the Board did not explain the specific understanding or principle within the knowledge of a skilled artisan that would motivate one with no knowledge of Rouffet's invention to make the combination, this court infers that the examiner selected these references with the assistance of hindsight. This court forbids the use of hindsight in the selection of references that comprise the case of obviousness. See In re Gorman, 933 F.2d 982, 986, 18 U.S.P.Q.2D (BNA) 1885, 1888 (Fed. Cir. 1991). Lacking a motivation to combine references, the Board did not show a proper *prima facie* case of obviousness. This court reverses the rejection over the combination of King, Rosen, and Ruddy.

The Combination of Freeburg and Levine

Freeburg teaches a cellular radiotelephone system based on a constellation of low Earth orbit satellites that use conical beams to transmit from **18 the satellite to both fixed and mobile Earth stations. Levine teaches an Earth-based cellular radio system that uses fan beams broadcast from antenna towers. Levine's elliptical footprints are aligned with the road grid. To increase the capacity of traditional ground-based systems through frequency reuse techniques, Levine teaches the use of antennas that broadcast signals with smaller footprints than the prior art system. Thus, Levine actually increases the number of overlap regions between cells and, hence, the number of potential handovers. Figure 1 of the Levine patent illustrates its alignment of beam footprints:

[SEE FIGURE 1 IN ORIGINAL]

**1359 As a mobile unit (e.g., a driver using a car phone) moves through a succession of overlapping zones, Levine uses selection algorithms to determine which of the cells is aligned with the travel direction of the mobile unit. These algorithms then select this cell for use while continually monitoring intersecting cells in the event that the mobile unit changes direction.

Once again, this court notes significant differences between the teachings of the application and the Levine-Freeburg combination. The critical Levine

reference again involves [**19] a beam from an Earth station without any reference to the "travel direction of [a] satellite." More ver, Levine actually multiplies the number of potential handovers and then uses software to sort out the necessary handovers from the unnecessary. However, the Board explains the reasons that one possessing the lofty skills characteristic of this field would know to account for the differences between the claimed invention and the prior art combination. This court discerns no clear error in that reliance on the considerable skills in this field.

This court does, however, discern reversible error in the Board's identification of a motivation to combine Levine and Freeburg. In determining that one of skill in the art would have had motivation to combine Levine and Freeburg, the Board noted that "the level of skill in the art is very high." As noted before, this observation alone cannot supply the required suggestion to combine these references. The Board posits that the high level of skill in the art overcomes the absence of any actual suggestion that one could select part of the teachings of Levine for combination with the satellite system disclosed by Freeburg.

As noted above, [HN9]the [**20] suggestion to combine requirement is a safeguard against the use of hindsight combinations to negate patentability. While the skill level is a component of the inquiry for a suggestion to combine, a lofty level of skill alone does not suffice to supply a motivation to combine. Otherwise a high level of ordinary skill in an art field would almost always preclude patentable inventions. As this court has often noted, invention itself is the process of combining prior art in a nonobvious manner. See, e.g., Richdel, 714 F.2d at 1579; Environmental Designs, 713 F.2d at 698. Therefore, even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. Cf. Gechter v. Davidson, 116 F.3d 1454, 43 U.S.P.Q.2D (BNA) 1030 (Fed. Cir. 1997) (explaining that the Board's opinion must describe the basis for its decision). In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious.

The Board's naked invocation of skill in the art to supply a suggestion to combine [**21] the references cited in this case is therefore clearly erroneous. Absent any proper motivation to combine part of Levine's teachings with Freeburg's satellite system, the rejection of Rouffet's claim over these references was improper and is reversed.

IV

The Board reversibly erred in determining that there was a motivation to combine either the teachings of King, Rosen, and Ruddy or of Freeburg and Levine in a manner that would render the claimed invention obvious. Because this predicate was missing in each case, the Board did not properly show that these references render the claimed invention obvious. Therefore this court reverses the Board's decision upholding the rejection of Rouffet's claims. In light of this disposition, Rouffet's pending motion to remand the case to the Board for further consideration is denied as moot.

COSTS

Each party shall bear its own costs.

REVERSED.

IN RE MARK A. VAECK, WIPA CHUNGJATUPORNCHAI and LEE MCINTOSH

N . 91-1120

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

947 F.2d 488; 1991 U.S. App. LEXIS 24846; 20 U.S.P.Q.2D (BNA) 1438

October 21, 1991, Decided

PRIOR HISTORY: [**1]Appealed from: United States Patent and Trademark Office Board of Patent Appeals and Interferences.

DISPOSITION: Affirmed in Part, Reversed in Part.

CASE SUMMARY

PROCEDURAL POSTURE: Appellant inventors sought review of a decision of the United States Patent and Trademark Office Board of Patent Appeals and Interferences, which rejected their claims as unpatentable under 35 U.S.C.S. § 103 and 35 U.S.C.S. § 112 because their invention was *prima facie* obvious and disclosure was not enabling.

OVERVIEW: The inventors sought review of the rejection of their patent claims under 35 U.S.C.S. § 103 and 35 U.S.C.S. § 112, as *prima facie* obvious, and not enabling, in their application for a genetic engineering technique for the production of insecticidal proteins. The Board of Patent Appeal's applied eleven prior art references against the claims. The court reversed the rejection based on obviousness for failure to establish *prima facie* case because prior art offered no suggestion of substitution that was different between the claimed invention and prior art, and a reasonable expectation of success was not present. The court affirmed rejection based on enablement, holding that there was no reasonable correlation between narrow disclosure in specification and broad scope of protection sought because disclosure did not enable one of ordinary skill to make and use invention as recited in claims without undue experimentation.

OUTCOME: The rejection of the inventors' claims for obviousness was reversed because suggestion and reasonable expectation of success was not present in prior art. Rejection based on enablement was affirmed because disclosure did not enable one of ordinary skill to make and use invention without undue experimentation.

CORE TERMS: gene, cyanobacteria, protein, invention, host, promoter, disclosure, species, insecticidal, examiner, cyanobacterium, disclose, encoding, skill, specification, chimeric, bacteria,

sequence, transformed, heterologous, comprising, plasmid, enablement, organism, coli, cell, experimentation, obviousness, prokaryote, genera

LexisNexis(TM) HEADNOTES - Core Concepts

Patent Law > Nonobviousness > Tests & Proof of Obviousness

Patent Law > Jurisdiction & Review > Standards of Review

[HN1]Obviousness, within the meaning of 35 U.S.C.S. § 103, is a legal question which the court independently reviews, though based upon underlying factual findings which the court reviews under the clearly erroneous standard.

Patent Law > Nonobviousness > Tests & Proof of Obviousness

[HN2]Where claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under 35 U.S.C.S. § 103 requires, *inter alia*, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success. Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure.

Patent Law > Specification & Claims > Enablement Requirement

[HN3]The first paragraph of 35 U.S.C.S. § 112 requires, *inter alia*, that the specification of a patent enable any person skilled in the art to which it pertains to make and use the claimed invention. Although the statute does not say so, enablement requires that the specification teach those in the art to make and use the invention without undue experimentation. That some experimentation may be required is not fatal; the issue is whether the amount of experimentation required is undue.

Patent Law > Specification & Claims > Enablement Requirement

Patent Law > Jurisdiction & Review > Standards of Review

[HN4] Enablement is a question of law, which the court independently reviews, although based upon underlying factual findings, which the court reviews for clear error.

Patent Law > Specification & Claims > Enablement Requirement

Patent Law > U.S. Patent & Trademark Office Prosecution Procedures > Filing Requirements

[HNS] Patent applicants are not required to disclose every species encompassed by their claims, even in an unpredictable art. However, there must be sufficient disclosure, either through illustrative examples or terminology, to teach those of ordinary skill how to make and how to use the invention as broadly as it is claimed. The disclosure must adequately guide the art worker to determine, without undue experimentation, which species among all those encompassed by the claimed genus possess the disclosed utility. Where a claimed genus represents a diverse and relatively poorly understood group of microorganisms, the required level of disclosure will be greater than, for example, the disclosure of an invention involving a predictable factor such as a mechanical or electrical element.

COUNSEL: Ian C. McLeod, Ian C. McLeod, P.C., of Okemos, Michigan, argued for Appellant.

Teddy S. Gron, Associate Solicitor, Office of the Solicitor, of Arlington, Virginia, argued for Appellee. With him on the brief were Fred E. McKelvey, Solicitor and Richard E. Schafer, Associate Solicitor.

JUDGES: Rich, Archer, and Mayer, Circuit Judges. Mayer, Circuit Judge, dissenting.

OPINION BY: RICH

OPINION: [*489] RICH, Circuit Judge

This appeal is from the September 12, 1990 decision of the Patent and Trademark Office (PTO) Board of Patent Appeals and Interferences (Board), affirming the examiner's rejection of claims 1-48 and 50-52 of application Serial No. 07/021,405, filed March 4, 1987, titled "Hybrid Genes Incorporating a DNA Fragment Containing a Gene Coding for an Insecticidal Protein, Plasmids, Transformed Cyanobacteria Expressing Such Protein and Method for Use as a Biocontrol Agent" as unpatentable under 35 U.S.C. § 103, as well as the rejection of claims 1-48 and 50-51 under 35 U.S.C. § 112, first paragraph, for

lack of enablement. We reverse the § 103 rejection. The § 112 rejection is affirmed in part [**2] and reversed in part.

BACKGROUND

A. The Invention

The claimed invention is directed to the use of genetic engineering techniques n1 for production of proteins that are toxic to insects such as larvae of mosquitos and black flies. These swamp-dwelling pests are the source of numerous human health problems, including malaria. It is known that certain species of the naturally-occurring *Bacillus* genus of bacteria produce proteins ("endotoxins") that are toxic to these insects. Prior art methods of combatting the insects involved spreading or spraying crystalline spores of the insecticidal *Bacillus* proteins over swamps. The spores were environmentally unstable, however, and would often sink to the bottom of a swamp before being consumed, thus rendering this method prohibitively expensive. Hence the need for a lower-cost method of producing the insecticidal *Bacillus* proteins in high volume, with application in a more stable vehicle.

----- Footnotes -----

n1 Basic vocabulary and techniques for gene cloning and expression have been described in *In re O'Farrell*, 853 F.2d 894, 895-99, 7 U.S.P.Q.2D (BNA) 1673, 1674-77 (Fed. Cir. 1988), and are not repeated here.

----- End Footnotes -----

[**3]

As described by appellants, the claimed subject matter meets this need by providing for the production of the insecticidal *Bacillus* proteins within host cyanobacteria. Although both cyanobacteria and bacteria are members of the prokaryote n2 kingdom, the cyanobacteria (which in the past have been referred to as "blue-green algae") are unique among prokaryotes in that the cyanobacteria are capable of oxygenic photosynthesis. The cyanobacteria grow on top of swamps where they are consumed by mosquitos and black flies. Thus, when *Bacillus* proteins are produced within [*490] transformed n3 cyanobacterial hosts according to the claimed invention, the presence of the insecticide in the food of the targeted insects advantageously guarantees direct uptake by the insects.

----- Footnotes -----

n2 All living cells can be classified into one of two broad groups, prokaryotes and eukaryotes. The prokaryotes comprise organisms formed of cells that do not have a distinct nucleus; their DNA floats throughout the cellular cytoplasm. In contrast, the cells of eukaryotic organisms such as man, other animals, plants, protozoa, algae and yeast have a distinct nucleus wherein their DNA resides.

[**4]

n3 "Transformed" cyanobacteria are those that have successfully taken up the foreign *Bacillus* DNA such that the DNA information has become a permanent part of the host cyanobacteria, to be replicated as new cyanobacteria are generated.

----- End Footnotes -----

More particularly, the subject matter of the application on appeal includes a chimeric (i.e., hybrid) gene comprising (1) a gene derived from a bacterium of the *Bacillus* genus whose product is an insecticidal protein, united with (2) a DNA promoter effective for expressing n4 the *Bacillus* gene in a host cyanobacterium, so as to produce the desired insecticidal protein.

----- Footnotes -----

N4 "Expression" of a gene refers to the production of the protein which the gene encodes; more specifically, it is the process of transferring information from a gene (which consists of DNA) via messenger RNA to ribosomes where a specific protein is made.

----- End Footnotes -----

The claims on appeal are 1-48 and 50-52, all claims remaining in the [**5] application. Claim 1 reads:1. A chimeric gene capable of being expressed in Cyanobacteria cells comprising:

- (a) a DNA fragment comprising a promoter region which is effective for expression of a DNA fragment in a Cyanobacterium; and
- (b) at least one DNA fragment coding for an insecticidally active protein produced by a *Bacillus*

strain, or coding for an insecticidally active truncated form of the above protein or coding for a protein having substantial sequence homology to the active protein,

the DNA fragments being linked so that the gene is expressed.

Claims 2-15, which depend from claim 1, recite preferred *Bacillus* species, promoters, and selectable markers. n5 Independent claim 16 and claims 17-31 which depend therefrom are directed to a hybrid plasmid vector which includes the chimeric gene of claim 1. Claim 32 recites a bacterial strain. Independent claim 33 and claims 34-48 which depend therefrom recite a cyanobacterium which expresses the chimeric gene of claim 1. Claims 50-51 recite an insecticidal composition. Claim 52 recites a particular plasmid that appellants have deposited.

----- Footnotes -----

n5 In the context of the claimed invention, "selectable markers" or "marker genes" refer to antibiotic-resistance conferring DNA fragments, attached to the gene being expressed, which facilitate the selection of successfully transformed cyanobacteria.

----- End Footnotes -----

[**6]

B. Appellants' Disclosure

In addition to describing the claimed invention in generic terms, appellants' specification discloses two particular species of *Bacillus* (*B. thuringiensis*, *B. sphaericus*) as sources of insecticidal protein; and nine genera of cyanobacteria (*Synechocystis*, *Anacystis*, *Synechococcus*, *Agmenellum*, *Aphanocapsa*, *Gloecapsa*, *Nostoc*, *Anabaena* and *Fremyliella*) as useful hosts.

The working examples relevant to the claims on appeal detail the transformation of a single strain of cyanobacteria, i.e., *Synechocystis* 6803. In one example, *Synechocystis* 6803 cells are transformed with a plasmid comprising (1) a gene encoding a particular insecticidal protein ("B.t. 8") from *Bacillus thuringiensis* var. *israelensis*, linked to (2) a particular promoter, the P[L] promoter from the bacteriophage Lambda (a virus of *E. coli*). In another example, a different promoter, i.e., the *Synechocystis* 6803 promoter for the rubisco operon, is utilized instead of the Lambda P[L] promoter.

C. The Prior Art

A total of eleven prior art references were cited and applied, in various combinations, against the claims on appeal.

The focus of Dzelzkalns, n6 [**7] the primary reference cited against all of the rejected claims, is to determine whether chloroplast promoter sequences can function in cyanobacteria. To that end Dzelzkalns discloses the expression in cyanobacteria of a chimeric gene comprising a chloroplast promoter [*491] sequence fused to a gene encoding the enzyme chloramphenicol acetyl transferase (CAT). n7 Importantly, Dzelzkalns teaches the use of the CAT gene as a "marker" gene; this use of antibiotic resistance-conferring genes for selection purposes is a common technique in genetic engineering.

----- Footnotes -----

n6 12 *Nucleic Acids Res.* 8917 (1984).

n7 Chloramphenicol is an antibiotic; CAT is an enzyme which destroys chloramphenicol and thus imparts resistance thereto.

----- End Footnotes -----

Sekar I, n8 Sekar II, n9 and Ganesan n10 collectively disclose expression of genes encoding certain *Bacillus* insecticidal proteins in the bacterial hosts *B. megaterium*, *B. subtilis* and *E. coli*.

----- Footnotes -----

n8 137 *Biochem. and Biophys. Res. Comm.*
748 (1986).

[**8]

n9 33 *Gene* 151 (1985).

n10 189 *Mol. Gen. Genet.* 181 (1983).

----- End Footnotes -----

Friedberg n11 discloses the transformation of the cyanobacterium *Anacystis nidulans* R2 by a plasmid vector comprising the O[L]P[L] operator-promoter region and a temperature-sensitive repressor gene of the bacteriophage Lambda. While the cyanobacteria are attractive organisms for the cloning of genes involved in photosynthesis, Friedberg states, problems may still be encountered such as suboptimal expression of the cloned gene, detrimental effects on cell growth

of over-expressed, highly hydrophobic proteins, and rapid turnover of some gene products. To address these problems, Friedberg teaches the use of the disclosed Lambda regulatory signals in plasmid vehicles which, it states, have "considerable potential for use as vectors the expression of which can be controlled in *Anacystis* . . ."

----- Footnotes -----

n11 203 *Mol. Gen. Genet.* 505 (1986).

----- End Footnotes -----

Miller n12 compares [*9] the initiation specificities *in vitro* of DNA-dependent RNA polymerases n13 purified from two different species of cyanobacteria (*Fremyella diplosiphon* and *Anacystis nidulans*), as well as from *E. coli*.

----- Footnotes -----

n12 140 *J. Bacteriology* 246 (1979).

n13 RNA polymerase, the enzyme responsible for making RNA from DNA, binds at specific nucleotide sequences (promoters) in front of genes in DNA, and then moves through the gene making an RNA molecule that includes the information contained in the gene. Initiation specificity is the ability of the RNA polymerase to initiate this process specifically at a site(s) on the DNA template.

----- End Footnotes -----

Nierwicki-Bauer n14 identifies in the cyanobacterium *Anabaena* 7120 the start site for transcription of the gene encoding *rbcL*, the large subunit of the enzyme ribulose-1,5-bisphosphate carboxylase. It reports that the nucleotide sequence 14-8 base pairs preceding the transcription start site "resembles a good *Escherichia coli* promoter," but that the sequence 35 base pairs before the [*10] start site does not.

----- Footnotes -----

n14 81 *Proc. Natl. Acad. Sci. USA* 5961
(1984).

----- End Footnotes -----

Chauvat n15 discloses host-vector systems for gene cloning in the cyanobacterium *Synechocystis* 6803, in which the antibiotic resistance-conferring *neo* gene is utilized as a selectable marker.

----- Footnotes -----

n15 204 *Mol. Gen. Genet.* 185 (1986).

----- End Footnotes -----

Reiss n16 studies expression in *E. coli* of various proteins formed by fusion of certain foreign DNA sequences with the *neo* gene.

----- Footnotes -----

n16 30 *Gene* 211 (1984).

----- End Footnotes -----

Kolowsky n17 discloses chimeric plasmids designed for transformation of the cyanobacterium *Synechococcus* R2, comprising an antibiotic-resistant gene linked to chromosomal DNA from the *Synechococcus* cyanobacterium.

----- Footnotes -----

n17 27 *Gene* 289 (1984).

----- End Footnotes -----

[**11]

Barnes, United States Patent No. 4,695,455, is directed to the treatment with stabilizing chemical reagents of pesticides produced by expression of heterologous genes (such as those encoding *Bacillus* proteins) in host microbial cells such as *Pseudomonas* bacteria. The host cells are killed by this treatment, but the resulting pesticidal compositions exhibit prolonged toxic activity when exposed to the environment of target pests.

[*492] *D. The Grounds of Rejection*

1. The § 103 Rejections

Claims 1-6, 16-21, 33-38, 47-48 and 52 (which include all independent claims in the application) were rejected as unpatentable under 35 U.S.C. § 103 based upon Dzelzkalns in view of Sekar I or Sekar II and Ganesan. The examiner stated that Dzelzkalns discloses a

chimeric gene capable of being highly expressed in a cyanobacterium, said gene comprising a promoter region effective for expression in a cyanobacterium operably linked to a structural gene encoding CAT. The examiner acknowledged that the chimeric gene and transformed host of Dzelzkalns differ from the claimed invention in that the former's structural gene encodes CAT rather than insecticidally active protein. However, the examiner pointed [**12] out, Sekar I, Sekar II, and Ganesan teach genes encoding insecticidally active proteins produced by *Bacillus*, and the advantages of expressing such genes in heterologous n18 hosts to obtain larger quantities of the protein. The examiner contended that it would have been obvious to one of ordinary skill in the art to substitute the *Bacillus* genes taught by Sekar I, Sekar II, and Ganesan for the CAT gene in the vectors of Dzelzkalns in order to obtain high level expression of the *Bacillus* genes in the transformed cyanobacteria. The examiner further contended that it would have been obvious to use cyanobacteria as heterologous hosts for expression of the claimed genes due to the ability of cyanobacteria to serve as transformed hosts for the expression of heterologous genes. In the absence of evidence to the contrary, the examiner contended, the invention as a whole was *prima facie* obvious.

----- Footnotes -----

n18 Denotes different species or organism.

----- End Footnotes -----

Additional rejections were entered against various groups of dependent claims [**13] which we need not address here. All additional rejections were made in view of Dzelzkalns in combination with Sekar I, Sekar II, and Ganesan, and further in view of other references discussed in Part C above.

The Board affirmed the § 103 rejections, basically adopting the examiner's Answer as its opinion while adding a few comments. The legal conclusion of obviousness does not require absolute certainty, the Board added, but only a reasonable expectation of success, citing In re O'Farrell, 853 F.2d 894, 7 U.S.P.Q.2D (BNA) 1673 (Fed. Cir. 1988). In view of the disclosures of the prior art, the Board concluded, one of ordinary skill in the art would have been motivated by a reasonable expectation of success to make the substitution suggested by the examiner.

2. The § 112 Rejection

The examiner also rejected claims 1-48 and 50-51 under 35 U.S.C. § 112, first paragraph, on the ground that the disclosure was enabling only if claims limited in accordance with the specification as filed. Citing *Manual of Patent Examining Procedure* (MPEP) provisions 706.03(n) n19 and (z) n20 as support, the examiner took the position that undue experimentation would be required of [**14] the art worker to practice the claimed invention, in view of the unpredictability in the art, the breadth of the claims, the limited number of working examples and the limited guidance provided [**493] in the specification. With respect to unpredictability, the examiner stated that

the cyanobacteria comprise a large and diverse group of photosynthetic bacteria including large numbers of species in some 150 different genera including *Synechocystis*, *Anacystis*, *Synechococcus*, *Agmenellum*, *Nostoc*, *Anabaena*, etc. The molecular biology of these organisms has only recently become the subject of intensive investigation and this work is limited to a few genera. Therefore the level of unpredictability regarding heterologous gene expression in this large, diverse and relatively poorly studied group of prokaryotes is high. . . .

----- Footnotes -----

n19 MPEP 706.03(n), "Correspondence of Claim and Disclosure," provides in part: In chemical cases, a claim may be so broad as to not be supported by [the] disclosure, in which case it is rejected as unwarranted by the disclosure. . . .

n20 MPEP 706.03(z), "Undue Breadth," provides in part: In applications directed to inventions in arts where the results are unpredictable, the disclosure of a single species usually does not provide an adequate basis to support generic claims. *In re Sol*, 1938 C.D. 723; 497 O.G. 546. This is because in arts such as chemistry it is not obvious from the disclosure of one species, what other species will work. *In re Dreshfield*, 1940 C.D. 351; 518 O.G. 255 gives this general rule: "It is well settled that in cases involving chemicals and chemical compounds, which differ radically in their properties it must appear in an applicant's specification either by the enumeration of a sufficient number of the members of a group or by other appropriate language, that the chemicals or chemical combinations included in the claims are capable of accomplishing the desired result." . . .

----- End Footnotes -----

[**15]

The Board affirmed, noting that "the limited guidance in the specification, considered in light of the relatively high degree of unpredictability in this particular art, would not have enabled one having ordinary skill in the art to practice the broad scope of the claimed invention without undue experimentation. *In re Fisher*, 57 C.C.P.A. 1099, 427 F.2d 833, 166 U.S.P.O. (BNA) 18 (CCPA 1970)."

OPINION

A. *Obviousness*

We first address whether the PTO erred in rejecting the claims on appeal as *prima facie* obvious within the meaning of 35 U.S.C. § 103. [HN1] Obviousness is a legal question which this court independently reviews, though based upon underlying factual findings which we review under the clearly erroneous standard. *In re Woodruff*, 919 F.2d 1575, 1577, 16 U.S.P.Q.2D (BNA) 1934, 1935 (Fed. Cir. 1990).

[HN2] Where claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under § 103 requires, *inter alia*, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art [**16] that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success. See *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 U.S.P.Q.2D (BNA) 1529, 1531 (Fed. Cir. 1988). Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure. *Id.*

We agree with appellants that the PTO has not established the *prima facie* obviousness of the claimed subject matter. The prior art simply does not disclose or suggest the expression in cyanobacteria of a chimeric gene encoding an insecticidally active protein, or convey to those of ordinary skill a reasonable expectation of success in doing so. More particularly, there is no suggestion in Dzelzkalns, the primary reference cited against all claims, of substituting in the disclosed plasmid a structural gene encoding *Bacillus* insecticidal proteins for the CAT gene utilized for selection purposes. The expression of antibiotic resistance-conferring genes in cyanobacteria, without more, [**17] does not render obvious the

expression of unrelated genes in cyan bacteria for unrelated purposes.

The PTO argues that the substitution of insecticidal *Bacillus* genes for CAT marker genes in cyanobacteria is suggested by the secondary references Sekar I, Sekar II, and Ganesan, which collectively disclose expression of genes encoding *Bacillus* insecticidal proteins in two species of host *Bacillus* bacteria (*B. megaterium* and *B. subtilis*) as well as in the bacterium *E. coli*. While these references disclose expression of *Bacillus* genes encoding insecticidal proteins in certain transformed bacterial hosts, nowhere do these references disclose or suggest expression of such genes in transformed cyanobacterial hosts.

To remedy this deficiency, the PTO emphasizes similarity between bacteria and cyanobacteria, namely, that these are both prokaryotic organisms, and argues that this fact would suggest to those of ordinary skill the use of cyanobacteria as hosts for expression of the claimed chimeric genes. While it is true that bacteria and cyanobacteria are now both classified as prokaryotes, that fact alone is not sufficient to motivate the art worker as the [**18] PTO contends. [**494] As the PTO concedes, cyanobacteria and bacteria are not identical; they are classified as two separate divisions of the kingdom Prokaryotae. n21 Moreover, it is only in recent years that the biology of cyanobacteria has been clarified, as evidenced by references in the prior art to "blue-green algae." Such evidence of recent uncertainty regarding the biology of cyanobacteria tends to rebut, rather than support, the PTO's position that one would consider the cyanobacteria effectively interchangeable with bacteria as hosts for expression of the claimed gene.

-----Footnotes-----

n21 *Stedman's Medical Dictionary* 1139 (24th ed. 1982) (definition of "Prokaryotae"). Prokaryotic organisms are commonly classified according to the following taxonomic hierarchy: Kingdom; Division; Class; Order; Family; Genus; Species. 3 *Bergey's Manual of Systematic Bacteriology* 1601 (1989).

-----End Footnotes-----

At oral argument the PTO referred to additional secondary references, not cited against any independent claim (i.e., Friedberg, Miller, and Nierwicki-Bauer), [**19] which it contended disclose certain amino acid sequence homology between bacteria and cyanobacteria. The PTO argued

that such homology is a further suggestion to one of ordinary skill to attempt the claimed invention. We disagree. As with the Dzelzkalns, Sekar I, Sekar II, and Ganesan references discussed above, none of these additional references disclose or suggest that cyanobacteria could serve as hosts for expression of genes encoding *Bacillus* insecticidal proteins. In fact, these additional references suggest as much about differences between cyanobacteria and bacteria as they do about similarities. For example, Nierwicki-Bauer reports that a certain nucleotide sequence (i.e., the -10 consensus sequence) in a particular cyanobacterium resembles an *E. coli* promoter, but that another nearby nucleotide sequence (the -35 region) does not. While Miller speaks of certain promoters of the bacteriophage Lambda that are recognized by both cyanobacterial and *E. coli* RNA polymerases, it also discloses that these promoters exhibited differing strengths when exposed to the different polymerases. Differing sensitivities of the respective polymerases to an inhibitor are also [**20] disclosed, suggesting differences in the structures of the initiation complexes.

The PTO asks us to agree that the prior art would lead those of ordinary skill to conclude that cyanobacteria are attractive hosts for expression of any and all heterologous genes. Again, we can not. The relevant prior art does indicate that cyanobacteria are attractive hosts for expression of both native and heterologous genes involved in photosynthesis (not surprisingly, for the capability of undergoing oxygenic photosynthesis is what makes the cyanobacteria unique among prokaryotes). However, these references do not suggest that cyanobacteria would be equally attractive hosts for expression of unrelated heterologous genes, such as the claimed genes encoding *Bacillus* insecticidal proteins.

In *O'Farrell*, this court affirmed an obviousness rejection of a claim to a method for producing a "predetermined protein in a stable form" in a transformed bacterial host. 853 F.2d at 895, 7 U.S.P.Q.2d at 1674. The cited references included a prior art publication (the Polisky reference) whose three authors included two of the three co-inventor-appellants. The main difference [**21] between the prior art and the claim at issue was that in Polisky, the heterologous gene was a gene for ribosomal RNA, while the claimed invention substituted a gene coding for a predetermined protein. Id. at 901, 7 U.S.P.Q.2d at 1679. Although, as the appellants therein pointed out, the ribosomal RNA gene is not normally translated into protein, Polisky mentioned preliminary evidence that the transcript of the ribosomal RNA gene was translated into protein, and further predicted that if a gene coding for a protein were to be substituted, extensive translation might result. *Id.* W thus

affirmed, explaining that the prior art explicitly suggested the substitution that is the difference between the claimed invention and the prior art, and presented preliminary evidence suggesting that the [claimed] method could be used to make proteins.

.... [*495] ... Polisky contained detailed enabling methodology for practicing the claimed invention, a suggestion to modify the prior art to practice the claimed invention, and evidence suggesting that it would be successful.

Id. at 901-02, 7 U.S.P.Q.2d at 1679-80.

In contrast with the situation [*22] in *O'Farrell*, the prior art in this case offers no suggestion, explicit or implicit, of the substitution that is the difference between the claimed invention and the prior art. Moreover, the "reasonable expectation of success" that was present in *O'Farrell* is not present here. Accordingly, we reverse the § 103 rejections.

B. Enablement

[HN3] The first paragraph of 35 U.S.C. § 112 requires, *inter alia*, that the specification of a patent enable any person skilled in the art to which it pertains to make and use the claimed invention. Although the statute does not say so, enablement requires that the specification teach those in the art to make and use the invention without "undue experimentation." *In re Wands*, 858 F.2d 731, 737, 8 U.S.P.Q.2D (BNA) 1400, 1404 (Fed. Cir. 1988). That *some* experimentation may be required is not fatal; the issue is whether the amount of experimentation required is "undue." *Id.* at 736-37, 8 U.S.P.Q.2d at 1404. [HN4] Enablement, like obviousness, is a question of law which we independently review, although based upon underlying factual findings which we review for clear error. *See id.* at 735, 8 U.S.P.Q.2d at 1402. [*23]

In response to the § 112 rejection, appellants assert that their invention is "pioneering," and that this should entitle them to claims of broad scope. Narrower claims would provide no real protection, appellants argue, because the level of skill in this art is so high, art workers could easily avoid the claims. Given the disclosure in their specification, appellants contend that any skilled microbiologist could construct vectors and transform many different cyanobacteria, using a variety of promoters and *Bacillus* DNA, and could easily determine whether or not the active *Bacillus* protein was successfully expressed by the cyanobacteria.

The PTO made no finding on whether the claimed invention is indeed "pioneering," and we need not address the issue here. With the exception of claims 47 and 48, the claims rejected under § 112 are not limited

to any particular genus or species of cyanobacteria. The PTO's position is that the cyanobacteria are a diverse and relatively poorly studied group of organisms, comprising some 150 different genera, and that heterologous gene expression in cyanobacteria is "unpredictable." Appellants have not effectively disputed these assertions. Moreover, [*24] we note that only one particular species of cyanobacteria is employed in the working examples of appellants' specification, and only nine genera of cyanobacteria are mentioned in the entire document.

Taking into account the relatively incomplete understanding of the biology of cyanobacteria as of appellants' filing date, as well as the limited disclosure by appellants of particular cyanobacterial genera operative in the claimed invention, we are not persuaded that the PTO erred in rejecting claims 1-46 and 50-51 under § 112, first paragraph. There is no reasonable correlation between the narrow disclosure in appellants' specification and the broad scope of protection sought in the claims encompassing gene expression in any and all cyanobacteria. *See In re Fisher*, 57 C.C.P.A. 1099, 427 F.2d 833, 839, 166 U.S.P.Q. (BNA) 18, 24 (CCPA 1970) (the first paragraph of § 112 requires that the scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification). n22 Accordingly, [*496] we affirm the § 112 rejection as to those claims.

----- Footnotes -----

n22 The enablement rejection in this case was not based upon a post-filing date state of the art, as in *In re Hogan*, 559 F.2d 595, 605-07, 194 U.S.P.Q. (BNA) 527, 536-38 (CCPA 1977). *See also United States Steel Corp. v. Phillips Petroleum Co.*, 865 F.2d 1247, 1251, 9 U.S.P.Q.2D (BNA) 1461, 1464 (Fed. Cir. 1989) (citing *Hogan*); *Hormone Research Found. Inc. v. Genentech, Inc.*, 904 F.2d 1558, 1568-69, 15 U.S.P.Q.2D (BNA) 1039, 1047-48 (Fed. Cir. 1990) (directing district court, on remand, to consider effect of *Hogan* and *United States Steel* on the enablement analysis of *Fisher*), cert. dismissed, U.S. 111 S. Ct. 1434, 113 L. Ed. 2d 485, 59 U.S.L.W. 3687 (1991). We therefore do not consider the effect of *Hogan* and its progeny on *Fisher's* analysis of when an inventor should be allowed to "dominate the future patentable inventions of others." *Fisher*, 427 F.2d at 839, 166 U.S.P.Q. at 24.

----- End Footnotes -----

[**25]

In so doing we do *not* imply that patent applicants in art areas currently denominated as "unpredictable" must never be allowed generic claims encompassing more than the particular species disclosed in their specification. It is well settled that [HNS]patent applicants are not required to disclose every species encompassed by their claims, even in an unpredictable art. *In re Angstadt*, 537 F.2d 498, 502-03, 190 U.S.P.Q. (BNA) 214, 218 (CCPA 1976). However, there must be sufficient disclosure, either through illustrative examples or terminology, n23 to teach those of ordinary skill how to make and how to use the invention as broadly as it is claimed. This means that the disclosure must adequately guide the art worker to determine, without undue experimentation, which species among all those encompassed by the claimed genus possess the disclosed utility. Where, as here, a claimed genus represents a diverse and relatively poorly understood group of microorganisms, the required level of disclosure will be greater than, for example, the disclosure of an invention involving a "predictable" factor such as a mechanical or electrical element. *See Fisher*, 427 F.2d at 839, 166 U.S.P.Q. at 24. [**26] In this case, we agree with the PTO that appellants' limited disclosure does not enable one of ordinary skill to make and use the invention as now recited in claims 1-46 and 50-51 without undue experimentation.

----- Footnotes -----

n23 The first paragraph of § 112 requires nothing more than *objective* enablement. *In re Marzocchi*, 58 C.C.P.A. 1069, 439 F.2d 220, 223, 169 U.S.P.Q. (BNA) 367, 369 (CCPA 1971). How such a teaching is set forth, either by the use of illustrative examples or by broad terminology, is irrelevant. *Id.*

----- End Footnotes -----

Remaining dependent claim 47 recites a cyanobacterium which expresses the chimeric gene of claim 1, wherein the cyanobacterium is selected from among the genera *Anacystis* and *Synechocystis*. Claim 48, which depends from claim 47, is limited to the cyanobacterium *Synechocystis* 6803. The PTO did not separately address these claims, nor indicate why they should be treated in the same manner as the claims

encompassing all types of cyanobacteria. Although these claims are not limited to expression of [**27] genes encoding particular *Bacillus* proteins, we note what appears to be an extensive understanding in the prior art of the numerous *Bacillus* proteins having toxicity to various insects. The rejection of claims 47-48 under § 112 will not be sustained.

CONCLUSION

The rejection of claims 1-48 and 50-52 under 35 U.S.C. § 103 is *reversed*. The rejection of claims 1-46 and 50-51 under 35 U.S.C. § 112, first paragraph, is *affirmed* and the rejection of claims 47 and 48 thereunder is *reversed*.

AFFIRMED-IN-PART, REVERSED-IN-PART.

DISSENTBY: MAYER

DISSENT: MAYER, Circuit Judge, dissenting.

An appeal is not a second opportunity to try a case or prosecute a patent application, and we should not allow parties to "undertake to retry the entire case on appeal." *Perini America, Inc. v. Paper Converting Machine Co.*, 832 F.2d 581, 584, 4 U.S.P.Q.2D (BNA) 1621, 1624 (Fed. Cir. 1987); *Eaton Corp. v. Appliance Valves Corp.*, 790 F.2d 874, 877, 229 U.S.P.Q. (BNA) 668, 671 (Fed. Cir. 1986). But that is precisely what the court has permitted here. The PTO conducted a thorough examination of the prior art surrounding this patent application and concluded the claims would [**28] have been obvious. The board's decision based on the examiner's answer which comprehensively explains the rejection is persuasive and shows how the evidence supports the legal conclusion that the claims would have been obvious. Yet, the court ignores all this and conducts its own examination, if you will, as though the examiner and board did not exist. Even if I thought this opinion were more persuasive than the board's, I could [*497] not join it because it misperceives the role of the court.

The scope and content of the prior art, the similarity between the prior art and the claims, the level of ordinary skill in the art, and what the prior art teaches are all questions of fact. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. (BNA) 459, 467, 15 L. Ed. 2d 545, 86 S. Ct. 684 (1966); *Jurgens v. McKasy*, 927 F.2d 1552, 1560, 18 U.S.P.Q.2D (BNA) 1031, 1037 (Fed. Cir. 1991). And "where there are two permissible views of the evidence, the factfinder's choice between them cannot be clearly erroneous." *Anderson v. City of Bessemer City*, 470 U.S. 564, 574, 84 L. Ed. 2d 518, 105 S. Ct. 1504 (1985). The mere denomination of obviousness as a question of law does not give the court license to decide [**29] the factual matters afresh and ignore the requirement that they be

respected unless clearly erroneous. *In re Woodruff*,
919 F.2d 1575, 1577, 16 U.S.P.Q.2D (BNA) 1934,
1935 (Fed. Cir. 1990); In re Kulling, 897 F.2d 1147,
1149, 14 U.S.P.Q.2D (BNA) 1056, 1057 (Fed. Cir.
1990). There may be more than one way to look at the
prior art, but on this record we are bound by the PTO's
interpretation of the evidence because it is not clearly
erroneous and its conclusion is unassailable. I would
affirm on that basis.

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